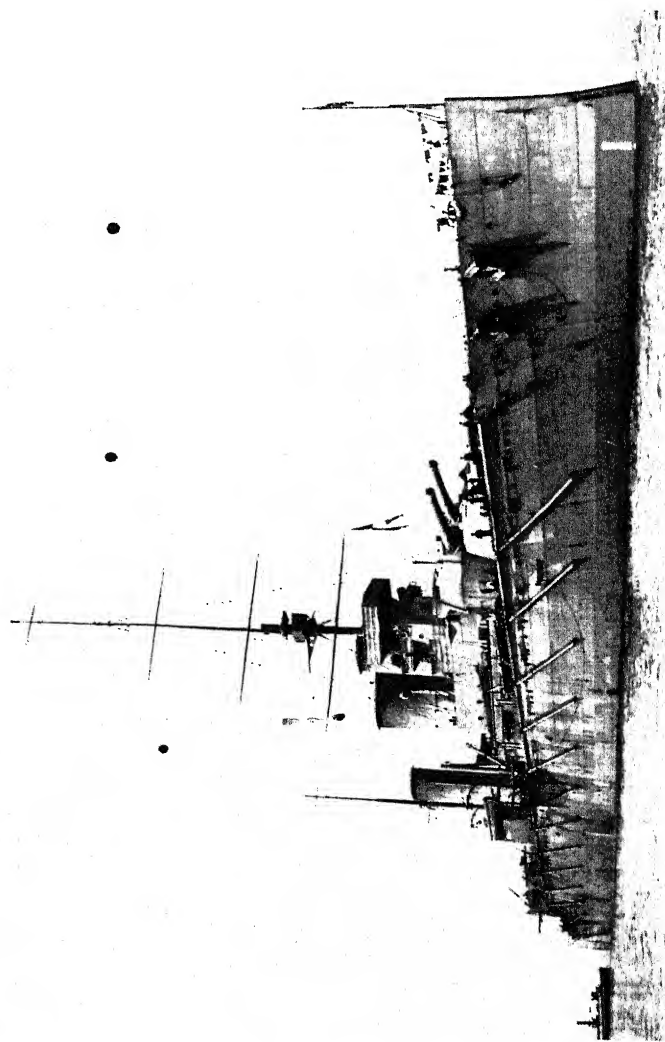


WHAT OF THE NAVY?



Photograph by G. West & Son, Seattle
H.M. BATTLE-CRUISER "QUEEN MARY"

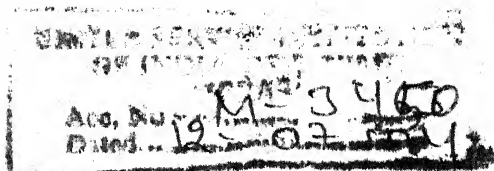
What of the Navy?

By

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With Eight Plates



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PREFACE

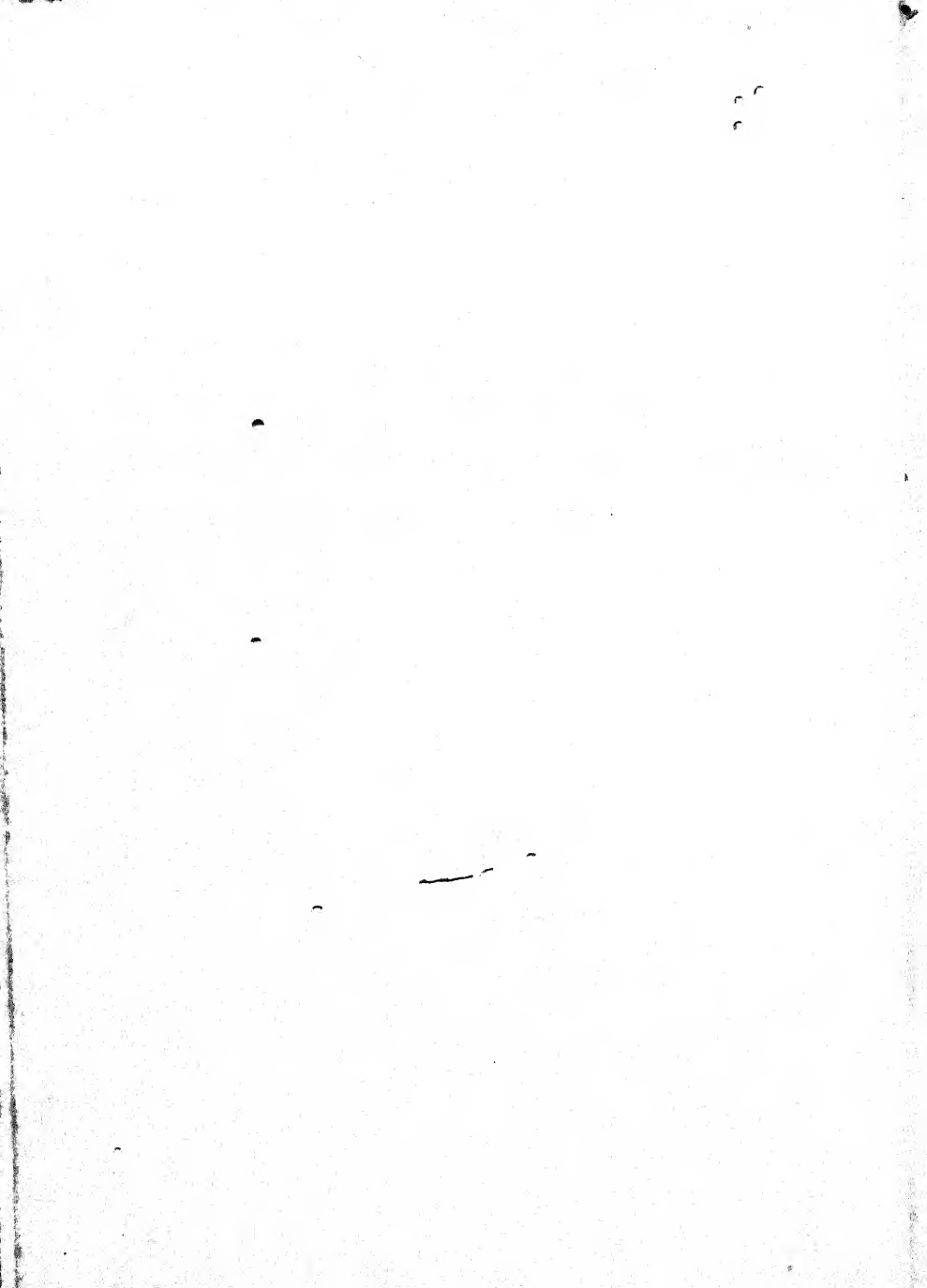
It is with some qualms that I venture to reprint these short papers, ranging in their treatment over a very wide yet ever extending field. They were written at spare moments during a period of several years, and have been touched up only to render the book to some extent connected narrative—if the term be not misapplied. I have to thank the very courteous owners or editors of the *Financial Review of Reviews*, the *Royal Magazine*, the *Oxford and Cambridge Review*, and *Cassell's Magazine* for the reappearance of much between these covers, since in their publications did they first see the light. It is scarcely necessary to add, in conclusion, that they do not purport in any way to be detailed, authoritative, or exhaustive; no one recognises better than do I that each branch of this subject of our Naval Defence touched on here is capable in

itself of extension beyond the limits of a large volume. As the honest expression of one devoted to our Naval Service, its traditions, life, development and its future, they claim a kindly criticism from an indulgent public.

• ALAN H. BURGOYNE.

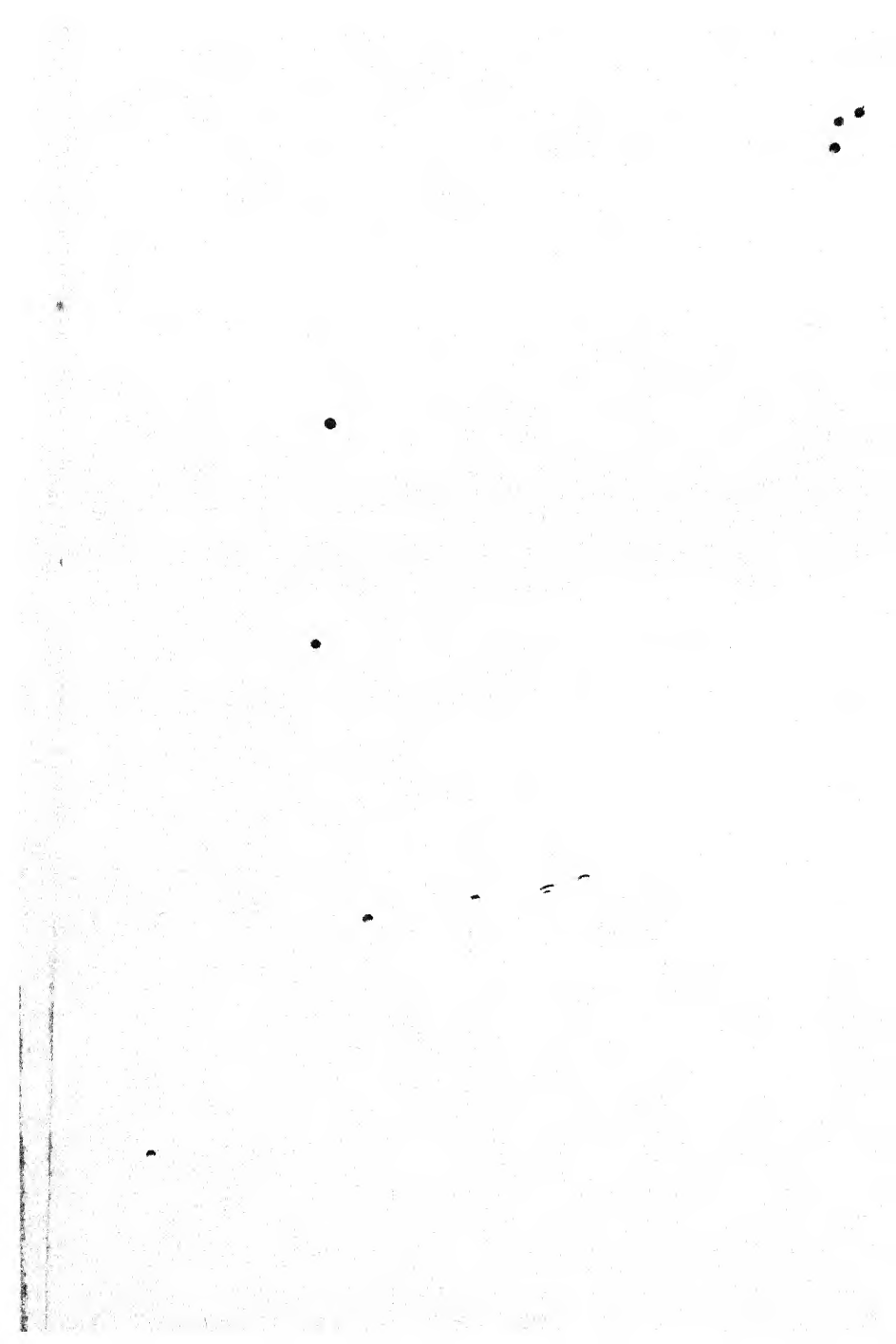
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WHAT OF THE NAVY?

CHAPTER I

ON ANGLO-GERMAN ANTAGONISM

THOSE of the German public who take an intelligent interest in international relations probably believe the British nation to-day to be split up into two sharply defined camps ; on the one hand there would seem to be those whose every thought is deliberately hostile to the progress and development of Germany, and on the other appears to be a section claiming the Teuton race not only as friends and brothers, but as a nation incapable of warlike action towards any other Power, however great the provocation.

It were well to shatter at the outset any cherished illusions to which either of these ideas may have given birth. It is an axiom almost that those who support a cause most ardently are they who give publicity to their convictions and ideas with the greatest vigour and frequency ; thus, it is the fanaticism of both points of view which most generally receives expression in the Press of this or any other country. The reason is not far to seek ; should an

English writer pen an article replete with threats of war against Germany, what more natural than that a reply should immediately follow from one of those whom we in England designate the "Peace-at-Any-Price" party? These extremists counterbalance each other in the public expression of their views, and their existence is introduced into this article merely that I may emphasise the fact that neither the one nor the other has any large body of followers in this country. The desire here is to set out in a manner that can be easily understood, both of our own and of the German people, a reasoned and dispassionate analysis of national feeling, and the likely effect thereof upon the relationship of the two countries in the immediate future.

One salient feature may be accepted as the basis of all remarks around this important subject, and that is the presence of a universal distrust of anything and everything done in Germany—and this distrust is not by any means insular, for it is to be noticed throughout the British Empire. This is not a matter for argument or discussion—it is an unfortunate, incontrovertible fact, obvious, deep-rooted, and dangerous. Let us see if we can discover whence it is come. In the first place, and I say it without equivocation, it sees its foundation in fear—fear that Germany is, by her own sagacity, individual industry, thrift and forethought, and, lastly, by her national self-reliance, becoming too

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prominent (and perhaps too antagonistic) a factor in the ordering of the world's progress.

To Germans this may, at first sight, appear a paltry and narrow-minded reason, but I ask them to glance back over the past centuries and recall in what manner this Empire of ours has been built up. To begin with, a restless national spirit induced our forefathers (those hardy voyagers) to seek for pastures new, and the resultant development of over-sea trade opened out an invitation to the cupidity of a commercial nation, which we were, and are, *par excellence*. From the conquests of commerce arose a certain "arrogance of race," which, I believe, is to this day an attribute of the Briton. Grant him this, be it praiseworthy or otherwise, and we have the plinth whereon to build the pyramid of our many naval successes. With these we acquired that for which we have often fought, the Sovereignty of the Seas. Generations either of victories or of unchallenged superiority upon the waves made this sovereignty a birthright of every man, woman and child holding allegiance to the King, and in that birthright each one of us (whatever be our sex, creed, or colour, so we belong to the British race) sees a pledge to posterity, to threaten which is well nigh equivalent to a challenge.

What do we now see happening across the North Sea? We see there the same restless spirit, but provoked in the case of Germany largely through

the failure of home resources to meet the demands of a natural increase in population. To such a problem there is but one solution—the nation must widen its sphere by extending its territory. True, the surplus population can emigrate; but then those unfortunates would merely lose their national individuality in the mass of those people whom for the future they have chosen for their own. To extend her territory, two courses lie open to Germany—either by settlement in a new country flying no flag, which means the pioneer work of development, or else by acquiring or conquering land at present occupied by some other nation. As regards the first suggestion, Germany sets out on her career of empire-building some two centuries too late—where, in these days, is the unowned land that can profitably be accepted as part of Germany's dominions?

Turn where you will and you find that the land the least developed, and least populated, yet most capable of immediate development and crying out for more population, is everywhere owned by—Britain! The effect such a realisation must have upon the feelings of nine out of ten Germans need surely not be laboured. That they should see in us a “dog-in-the-manger” nation is natural above all things—and that we should be in this position merely exaggerates the fact that the British Empire lies between the German people and the fulfilment of their national desires.

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Again we, for our part, note with apprehension that just as we were once restless in national spirit, so in like fashion are the Germans restless to-day. As to the cupidity of trade—who shall say in these days that, as a race, we are more keenly commercial than the business men of Germany? Why, the German nation is showing us the lead upon every side. They have not, owing to their more recent development as a world-nation, to suffer from that ultra-conservatism which preserves to us an obsolete system of competitive international trade. A judicious application of tariffs and a courageous recognition of the value of self-protection have brought to the Teuton manufacturer and his employee that labour for which the British working-man was so universally famed, and what has proved a great loss to our country has been a national gain to Germany. "Success breeds success" runs an old proverb, and from this success has sprung that cupidity for even vaster wealth which places the German nation once more in an analogous position to-day to that held by us a century or more ago.

Are we to blame Germany for this? Assuredly not; but human nature being what it is, the canker of defeat, of fear, of jealousy—call it by the name best pleasing to you—is working its disastrous way into the very life-blood of the British nation.

Then to "fear" must be added "resentment." The Briton believes that the hegemony of his race

is ordained for all time, and views with intense dislike the rapid advance of a nation which less than fifty years ago was merely in leading strings. In the old days, if we felt worried at the betterment in position of another country, and if that betterment assumed proportions detrimental to our habitual well-being, the course taken was simple. We picked a quarrel! The principle is bad, the suggestion even is unchristian—but in this sphere, where life is based upon the survival of the fittest, the argument is unanswerable.

Let us make the matter even clearer. Rome, Greece, Spain, Holland, Venice, and now Turkey, all saw a great day in the world's history; yet each in turn, and many more besides, reached a zenith from which a steady decline led to an eventual disruption. It is brought home to us here that never in the whole history of the British Empire has so powerful a nation grown up as the German nation. We see further that a time must come, if peace be kept until such an eventuation, when the German peoples will absorb the races of Denmark, Holland, and Belgium, and when, too, the vast dominions of Austro-Hungary will proclaim a blood-unity with the Fatherland. The German domination of Europe will then be complete. All these things we see, and knowing that they mark but steps in the rise of a dangerous competitor for World-Power, we think how best the situation may be combated.

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So much for the purely national side of the question. Turning to the naval side, a peculiar fact is to be remarked, viz. the German Admiralty is tacitly granted by the average Briton the powers of a Machiavelli. No argument, no proofs, no figures will convince him that Germany is not building many more ships than we who are better informed know her capable of constructing; and these ships are marvels, nay, miracles of ingenuity, possessing on a lesser displacement and at a cheaper price per ton a far more powerful armament, better protection, greater speed and an all-round superiority as against the designs of all other naval constructors in the world. Times without number German battleships have been "laid down" by the English Press when, as a fact, they had not even been ordered; and it is less than four years ago that distinguished statesmen over here deliberately declared that twenty-one vessels of the *Nassau*, *Von der Tann*, or later types, would be ready by the end of 1912!

Why, it will be asked, is all this fuss being made, and what are the causes? The answer to these two questions will bring a heavy load of blame on to the shoulders of the naval-economist section in this country. This one fact may be accepted—that to the ultra-economist party belong all the cranks and visionaries of the British electorate, and their ideas must, to meet the exigencies of party Government,

be taken into consideration by their leaders. Now crank ideas are ever costly ones, and, in their general scheme (though they may differ in detail), they all aim at the establishment of a social Utopia. The acceptance of even a small portion of these so-called social-improvement ideas places a heavy burden upon the national exchequer. Since the money must be found and our system of international trade places a strict limit upon the commercial means of obtaining financial supplies, other items must suffer; these items are invariably the armed forces of the Crown, the Navy and Army.

What did a recent Liberal Prime Minister do in regard to the Navy (for the Army need not be considered here)? He proposed to the German people that if they would curtail their naval programme we would endeavour to do the same, and as an earnest of good intent seriously jeopardised our naval position by abandoning several armoured units stated by his expert advisers to be necessary! Imagine for one minute what the nation as a whole thought of this suggestion. Through the entire history of our Empire had ever such a proposal been put forward? It smacked of two things—the “fear” to which I have already referred, and “insult” to the common sense of a great nation. Germany, quite naturally, would have none of it, and probably many a German Foreign Office official had a hearty laugh at the guileless stupidity that had dictated so infantile a move.

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As though it was our business how large the Navy of Germany should be!

Then, when taxed in our Houses of Parliament with doing an unworthy thing, and probably thereby juggling with the safety of the country, we were assured that never had the British Navy been in a more commanding position! If that was not accentuating the insult to Germany, I am no reader of riddles. It resembled a powerful man going up to a small boy and asking him not to grow, for fear he also should become powerful! Yet in spite of the inanity of all this there are men who to-day even boast of this incident as one wholly praiseworthy. What did they do next? They curtailed our naval programmes to such a point that, subsequent to the outcry that most naturally arose, our Colonies stepped in and offered to the Motherland those vessels her rulers had not the patriotism themselves to provide. The last few years form a chapter in British history of which the nation as a whole cannot be very proud.

Then came the great agitation—an agitation created not a little (and it is a curious contradiction to have to set it down) by a number of grave and suggestive speeches made by the then First Lord of the Admiralty (Mr. Reginald McKenna), the Prime Minister (Mr. Asquith), and the Secretary of State for Foreign Affairs (Sir Edward Grey). When they spoke as they did they had one thing only

in their minds, viz. to stifle the opposition of the "Little England" or "Peace-at-Any-Price" party in the House of Commons. They did this most effectually, but they did more—in an entirely unexpected direction; they managed to frighten the whole of the British peoples as they had never been frightened before, and they added a thousandfold to the unfortunate antagonism towards Germany, already a very serious factor. The cry "We want eight (Dreadnoughts) and we won't wait" went up throughout the land as though with a single voice—and we had them! And, too, we have in addition two immense battle-cruisers presented by the Dominion of New Zealand and the Commonwealth of Australia, a vast battleship as a gift from the Federated Malay States, and, finally, the royal (if postponed) donation of three ships by the Canadian Government.

But this is going to cost a lot of money, and money hits each Briton individually. He will look around and say to himself: "I don't mind taxes for home improvements—they all benefit me directly, or indirectly; nor do I grudge taxes for a moderate Navy and Army. But when I have to pay increasing annual amounts for Dreadnoughts and super-Dreadnoughts merely because Germany considers it necessary to have a navy, it's about time Germany was spoken to rather seriously."

I beg leave to emphasise here that I write not

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as an insular Englishman who has never left his own country and whose views of life are limited to the narrow horizon of his own shores, but as one who has voyaged in every clime of the world, who has lived in France, Germany, Oceania, Japan, and America, and has rubbed shoulders with the races of the North, South, East, and West. Travel broadens a man's views and lends him a clear discrimination; hence the claim that what is written here represents a national and not an individual feeling. There is current to-day a most inexcusable but none the less dangerous dislike of Germany, dangerous because it verges on personal hate. Go to any political meeting you like, and the country that is held up to impress the audience of the danger the nation is rushing to is—Germany. The British workman is suffering because of the competition of—Germany. In a word, Germany is the prod of modern English politics, and she is used in a manner highly injurious to the valued friendly relations of the two countries.

Similar situations have arisen before—in those days when we had wars every few years! Let any German ask a friend of his who has been resident here for any length of time the general opinion as to the eventual outcome; the answer is always the same—and it is not reassuring.

So deeply ingrained is becoming the warlike idea that excuses are now being found for it. "We are

becoming decadent as a nation because our men have forgotten the use of arms!" says one. "The militarism of the race needs stimulation to give it national backbone," says another. "History teaches us that a long peace leads to indulgence and luxury; we are becoming too indolent and pleasure-loving" will say a third—and, really, all these sayings are correct. Let us make no mistake; unless a miracle intervened, a crisis might easily eventuate in a disastrous war between Germany and England. All Germany's protestations are valueless—so are similar protestations from this side. It is the drifting of a nation's destiny for weal or woe. It is well, however, to speak plainly in this matter; there is too much writing at "cross-purposes," and if the true situation be bravely faced and accepted there will be a better chance by far of warding off a breach of friendly relations than by crying "Peace" when there is no peace.

The natural law of the "survival of the fittest" governs, and always will govern, the rise and fall of empires; we think we are the fittest and we resent any suggestion by another race that this is not so. We should beware, however, lest this belief lead us to test its truth in armed conflict.

In conclusion let me say this: no Briton deep down at the bottom of his heart wants a war. I am convinced of it, and feel certain that the present tendency to talk of a war with Germany as inevitable

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and, therefore, the sooner it comes the better, is largely the result of habit. We must have a national foe—France has dropped out of favour for that place, and Germany, by reason of her commercial and maritime rivalry, is the proper one to fill it. The steady intercourse of the two peoples upon peaceful lines, the cessation of derogatory articles, the avoidance above all things of international “incidents,” these are but a few of the ways whereby the present dangerous trend may be turned into safer, wiser, and more pacific channels.

CHAPTER II

ON FINANCE IN RELATION TO NAVAL DEFENCE

THE present interest evinced by all sections of the British Public in our first and (whilst the Territorial system is in the melting pot, and aeronautics practically ignored) sole line of defence would suggest to an unbiased observer that until recently the urgent national importance of sea-power to the Empire has never fully been realised. A series of scares—largely unnecessary and based upon premises wholly untenable in the light of argument and fact—much newspaper controversy—frequently fatuous and beside the mark—and, finally, the dragging of the Navy into the arena of party politics, a course as indefensible as it has proved harmful, have centred the gaze of the man in the street upon those that go down to the sea in ships, and this is not always to the latter's advantage. For the Navy is our "All in All"—shameful, therefore, that differences of opinion in regard to detail should have permitted the development of patent and baneful schisms upon a subject wherein, removing the petty causes of friction, our race is, irrespective of colour, sex and creed, entirely

at one. It has been the writer's thankless task to steer a middle course—for, assuredly, in discussing the progress of our naval defence, no judgment worthy of acceptance can be evolved from a mind swayed by personal feeling or party considerations. Having on many occasions been privileged to touch the *matériel* aspect of the question,* it is necessary at the same time to recognise that whereas tons and guns are important, and the men controlling and behind them more important still, the money wherewith these two desiderata alone can be maintained at a pitch of unequalled efficiency does not fall as manna from the skies.

Therefore, despite mendacious and frequently vindictive ebullitions to the contrary, whilst the British public is now convinced that both in ships and personnel their fleet is to-day supreme upon the seas, it is desirable to enforce the truth that the enormous sums of money expended to this end have been so expended to the very best advantage.

Since the abandonment of the principle of the Two-Power-Standard, a new and wiser idea has seized the public imagination. It may be summed up thus—that the British Navy should hold a strength in completed capital ships in the ratio of two to one of the next strongest Naval Power, with the necessary complement of all subsidiary vessels. This is definite

* Dealt with in its various phases in other chapters of this volume.

—this is clear. But whilst it has been framed for the masses, from whom a wise discrimination on technical subjects cannot be, and is not, expected, it is not sufficiently lucid, it would seem, for the asses. This is strong language—I do not believe in meat for babes ; but to those determined in their discontent naught that mortal man may devise as text will ever satisfy. “The Two-Keels-To-One-Standard means what I have written—that and nothing more. All of which is introduced because as editor (for sins, doubtless many, though not yet called to mind) of a popular Naval Annual I receive countless communications complaining that we are not spending £2 to Germany’s £1, that we have not two Dreadnought Docks to one (which we have, and more) and—shades of Solomon—that we should reduce our personnel because we have rather more than two men to one ! He was a political opponent who said “ enough of this foolery ”—on the original occasion it was scarcely apposite, yet the remark is peculiarly useful here. Having cleared the air of possible misconceptions, let us return to the spending of the annual naval estimates—but not upon a basis of £2 to £1 of the next strongest naval Power.

Admiral Paris stated over fifty years ago that the farther we go in history and development the more will wars be fought with money. Money, from the national standpoint, is purely credit. No one questions the capability of the British Nation to

maintain its credit to the extent of the annual naval estimates—be they £5,000,000 or £50,000,000, which latter figure must soon be attained. The reason that demands for money for Naval purposes are at no time likely to be met with more than factional criticism is that each unit of our race is imbued, willy-nilly, with the knowledge that the possession of no fleet (or an insufficient fleet which, whilst more expensive, is equally lacking in value) means foreign dominance. That is to say, an axiom may be framed in this wise, “a supreme fleet is national insurance.” Taking up this point, let us see how other nations stand in regard to it. In the first place, to us a Navy is a necessity—to other Powers (and I speak generally) it is a luxury. Again, to us the Navy is primary in the matter of defence—to other Powers it is subsidiary. We, as a nation, have attained greatness as the result of our over-sea possessions bringing world-commerce in their train—other Powers have sought to follow us in over-sea possessions and international commerce, as the result of greatness attained within the confines of their own frontiers. Through our commerce, self-governing Dominions, and Colonies, our very life as an Empire and nation is given as hostage to the hazard of the seas—other Powers may lose all these and yet be accounted of some worth in the councils of the Universe.

It would be little surprising, therefore, if it were found that our national insurance cost us—again,

let me emphasise, our very existence is at stake—considerably more from the naval standpoint than is the case with other nations. But is this so? To bring it to figures, showing something of the interests insured and protected, the appended table is not without merit. Herein is given the amount estimated to be expended during the year 1912 on the various navies for every square mile of territory, home or colonial, owned by the several Powers enumerated.

Nation	Area in Square Miles	Naval Estimates 1912-13	£ per Square Mile
British Empire .	13,663,000	£45,075,400	3.29
France . . .	4,207,054	18,090,800	4.3
U.S.A. . . .	3,571,492	26,540,000	7.43
Germany . . .	1,236,600	22,609,500	18.23
Austria-Hungary	241,333	5,842,000	24.2
Italy	295,780	9,426,500	31.87

Only one other nation approaches us in the moderation of expenditure towards property insured—France. Yet France has an immense army—a conscript army—to pay for in addition. The figures are significant—would it be overmuch to double our expenditure, if necessary, to attain the same degree of safety? Not with this table to guide us. But with it all, our poundage is deceptive, for it excludes direct expenditure made by Australia, New Zealand, etc., either upon units or bases, all tending to reduce

FINANCE AND NAVAL DEFENCE 19

our figure of cost. Even so, there may be doubtless those who find no comfort in the foregoing and will say (as has been spoken oft-times in the past) "figures may be made to prove anything." No accountant, set to test a commercial concern, remains content with results attained by a single method—we also will use this commercial way and take further counsel with facts upon other lines. How many persons owing allegiance to the flags of the six nations mentioned are insured for each pound spent?

Nation	Population	Naval Estimates 1912-13	People Insured per £
British Empire .	434,300,000	£45,075,400	9·63
Austria-Hungary	49,420,000	5,842,000	8·45
France . . .	91,100,000	18,090,800	5·03
Italy . . .	33,850,000	9,426,500	3·59
Germany . . .	79,460,000	22,609,500	3·51
U.S.A. . . .	93,402,000	26,540,000	3·51

The estimates of population are approximately correct for the beginning of the year 1911.* Here again the wonderful value given us for our money is forcibly brought home to us. Yet there is still a further table, and a better, for the emphasising of my point. The prosperity of a nation, its position in the world's councils, its national stability for credit amongst its neighbours, are all vested in its

* Unfortunately no later date, common to all nations, can be taken.

industries. This, in its development, can take but three lines—commerce or industry within its own immediate borders, commerce with its distant dominions and colonies, or over-sea commerce of an international nature. Indisputably our future welfare at the moment, owing to declining industries and failing agriculture at home, must be found in the last two of these. Shipping is wealth; possibly it were better that some of the funds now expended in proclaiming ourselves the carriers of the globe should be differently earned and dispensed, yet, shipping is wealth. Now, though a navy's two primary functions are, firstly, to maintain unimpaired the lines of communication and, secondly, to annihilate the fleets of the enemy, it is equally certain that a navy strong enough adequately to fulfil these essentials will by force of circumstance (and fact of execution!) be protecting our very lifeblood as the hub of the Empire, i.e. our over-sea trade. How much are we paying as a nation per ton of shipping flying the British flag? The point is all-important.

Nation	Total Ships	Tons of Shipping	Naval Estimates	£ per ton
British Empire	11,444	19,874,360	£45,075,400	2.26
Germany	2,213	4,628,983	22,609,500	4.88
U.S.A.	3,442	5,258,487	26,540,000	5.04
Austria-Hungary	395	903,067	5,842,000	6.46
Italy	1,090	1,398,582	9,426,500	6.7
France	1,491	2,052,518	18,090,800	8.81

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A note or two upon these figures. First, with a supreme fleet our huge maritime strength is life to us, just as it would be our most vulnerable point did our Navy decline below the proper standard of superiority. To Germany, however, her merchant shipping, added to her uncomfortable geographical situation, is a vast hostage to fortune waiting, should we be engaged in war with her (and wars *do* eventuate despite the Hague Tribunal), to fall into the lap of Britannia. To him that hath shall be given!

Of the United States total, 622 units and 2,359,334 tons are on the great northern lakes. Those objecting to their inclusion may make the necessary alterations to please themselves. (Incidentally, all the shipping figures are extracted direct from Lloyd's Registered Book, 1912-13, and exclude any ship of under 100 tons.)

The monetary value of our oversea trade is immense—no less than £1,200,000,000! Germany, next in order, totals but £400,000,000. We therefore pay £3.69 per cent. on value carried ~~to~~ ~~£5.5~~ per cent. paid in Germany.

We come now to a few figures concerning the war-fleets themselves. The foregoing pages have been dealing with the broad principle of international expenditure on navies as it exists to-day. Let us touch the very articles, first in the aggregate and next individually, and see how well we come out of this test. On p. 23 are figures giving the

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WHAT OF THE NAVY?

total number of completed effective units possessed by the six Powers enumerated on March 31, 1913. These are extracted in the main from the 1912-13 issue of the "Navy League Annual," and may absolutely be relied upon. "A" represents battleships and battle-cruisers of under twenty years of age and displacing 6,000 tons or over; "B" are the armoured cruisers of less than fifteen years of age and displacing at least 6,000 tons; "C," protected cruisers of less than fifteen years of age and displacing over 2,000 tons. The other vessels mentioned speak for themselves.

Here, indeed, is food for thought. Read these figures how you will and our percentage of possessions considerably exceeds our percentage of total expenditure. But our estimates cover everything, dockyards, new construction, men, etc.—take any of these and it will be seen that the advantage lies with us. The constant quibbler will plead that here is sure proof of lacking efficiency as the result of under expenditure—space does not permit of confutation of such arguments, easy as it would be, and it suffices to state with the emphasis of knowledge and conviction that, though criticism might be found against minor features, our Naval Service as a whole is more remarkable for its general all-round efficiency to-day, whether in administration, personnel, material, or construction, than for any other virtue.

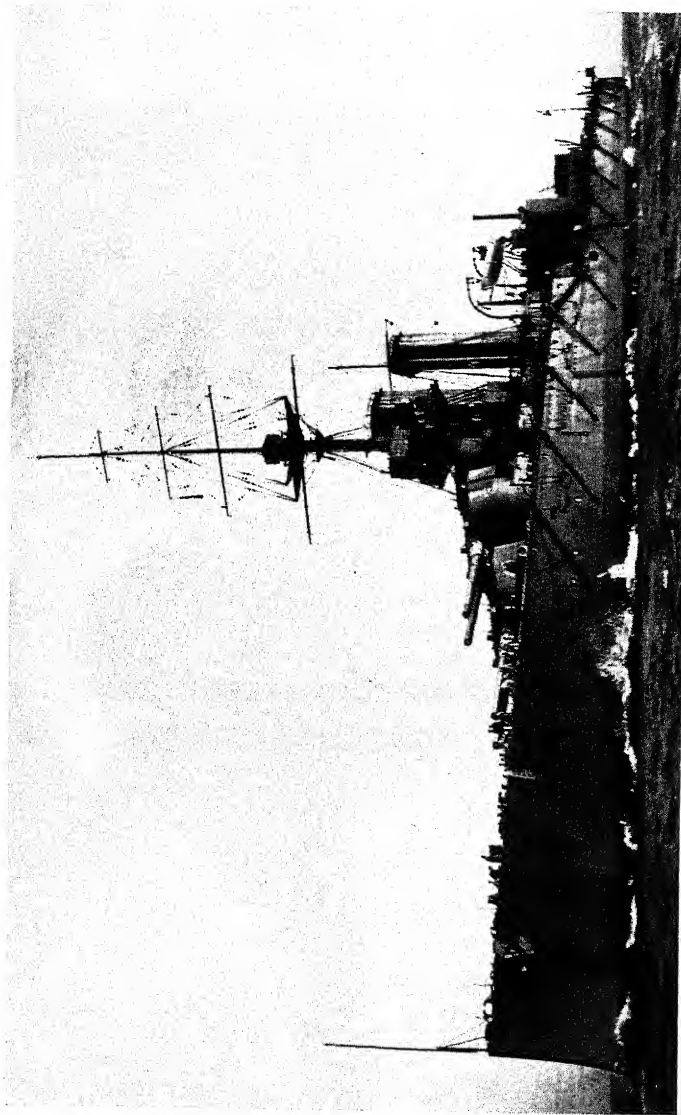
One point remains open for hostile comment,

COMPARATIVE STATEMENT OF THE ESTIMATED EXPENDITURE OF THE GREAT
NAVAL POWERS FOR 1912-13 AND THE POSITION OF THEIR RESPECTIVE
NAVIES

	British Empire	Germany	U.S.A.	France	Italy	Austria	Totals	British Percentage of Total
Naval Estimates, 1912-13	£45,075,400	£22,609,500	\$26,540,000	£18,090,800	£9,423,500	£4,842,000	£127,634,200	36.3
No. of Units— A.	62	33	30	19	9	10	168	38
Aggregate Tonnage	1,035,550 tons	518,442 tons	470,403 tons	271,686 tons	114,813 tons	118,727 tons	2,529,827 tons	41
No. of Units— B.	34	8	13	18	7	1	81	42
Aggregate Tonnage	408,800 tons	82,775 tons	169,180 tons	182,994 tons	61,209 tons	7,185 tons	909,543 tons	44.7
No. of Units— C.	33	30	10	1	2	3	79	41.8
Aggregate Tonnage	181,170 tons	108,625 tons	39,937 tons	5,595 tons	5,798 tons	8,175 tons	283,200 tons	45.5
No. of Serviceable Destroyers	184	120	42	73	23	12	454	40.5
No. of Serviceable Submarines	68	18	25	73	11	6	208	32.7
Personnels—Round Numbers	146,000	70,000	66,500	64,000	33,500	18,000	398,000	36.7

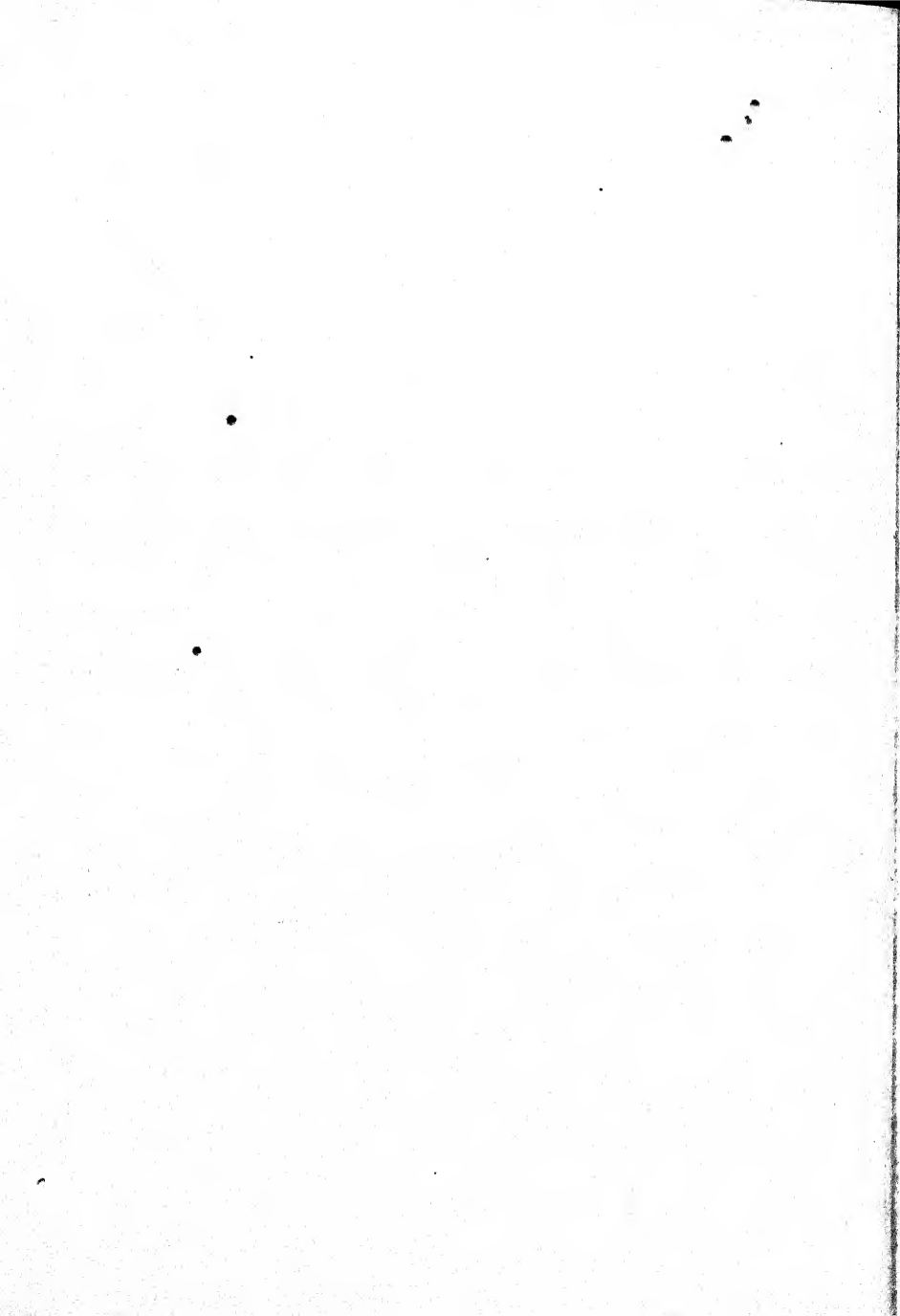
legitimate were it based on fact. Strength at sea does not rest merely in numbers and tonnage; if this were so, Turkey would have put up a good fight against Italy! We must prove that ship-unit for ship-unit our vessels are not only individually more powerful than foreign contemporaries, but also that that additional power has not been obtained at the sacrifice of greater cost. True, even did it cost more, the price would be a necessary part of our national insurance. The arbitrament of war at sea is still, as through all history, in the power and number of capital-ships, those fitted to lie in line and give and take the hard knocks of a general fleet action. Of all of these ships those springing from the Dreadnought type, initiated in 1905, are the most in the public mind. Since the advent of the name-ship, development has proceeded apace, until we find in the *King George V.* and *Queen Elizabeth* vessels much farther in advance of the *Dreadnought* than was she of her immediate predecessors, the *Agamemnon* and *Lord Nelson*.

The table on p. 25 shows us the total cost of each unit, the price we pay for mobility (and it is seen that we obtain greater speed for our designed engine power in ratio to cost paid per steam unit), and the price we pay for direct striking force. The earliest of her type, the *Dreadnought*, is placed beside the others. She was experimental, was completed in sixteen months and therefore (with other reasons) abnormally



Photograph by Stephen Cribb, Southsea

H.M.S. "KING GEORGE V"



COMPARATIVE STATEMENT OF THE COST OF BUILDING DREADNOUGHTS TO THE
GREAT NAVAL POWERS

	British			German			U.S.A.	French	Italian	Austrian
	Dread-nought	King George V.	Queen Elizabeth	Nassau	Ostfriesland	Kaiser	Arkansas	Courbet	C. di Cavour	V. Units
Date of Completion	1906	1912	1914	1910	1911	1912	1912	1913	1913	1912
Armament, Main	10 12-in.	10 18.5-in.	8 16-in.	12 11-in.	12 12.2-in.	10 12.2-in.	12 12-in.	12 12-in.	13 12-in.	12 12-in.
Total First Cost	£1813,100	£1,965,000	£2,480,000	£1,840,000	£2,304,300	£2,400,000	£2,280,000	£2,003,900	£2,000,000	£2,525,000
Displacement	17,900 tons	23,000 tons	27,500 tons	18,600 tons	22,440 tons	24,310 tons	26,000 tons	23,095 tons	22,840 tons	20,000 tons
Cost, per ton	£101.2	£85.4	£90.1	£98.9	£102.7	£98.7	£87.7	£113	£116.3	£126.2
Designed I.H.P.	23,000	31,000	58,000	20,000	25,000	28,000	28,000	29,000	24,000	25,000
Cost per H.P.	£78.8	£63.38	£42.75	£92	£92.1	£85.7	£81.4	£80.7	£108.3	£101.
Designed Speed	21 knots	21.5 knots	25 knots	19.5 knots	20.5 knots	21 knots	20.5 knots	20 knots	22 knots	20 knots
Weight of Broadside	6,800 lb.	14,000 lb.	15,000 lb.	6,084 lb.	7,848 lb.	9,810 lb.	10,440 lb.	9,700 lb.	11,950 lb.	11,772 lb.
Cost, per lb.	£266.1	£140.3	£158.9	£802.4	£293.5	£244.6	£218.3	£268.4	£217.6	£214.4
Lb. of Metal fired per ton of Displacement	379	608	567	327	349	403	401	421	584	588

expensive. But she was built alone; defects found in her, suggestions arising from the progress of her construction, all received attention, to the advantage of her successors. In Germany, like a man jumping into deep water thinking he could swim as a result of watching others do so, they laid down four huge units simultaneously. Since their design was bad from the start, amateurish in conception and mediocre in performance, the Germans find themselves possessed of a quartette of mechanical nondescripts for which it has proved impossible to find a market!

The conclusions to be drawn from the foregoing observations are, then, twofold. In the first place we obtain national security at a price ridiculous indeed when compared with the interests protected; secondly, the (relatively) small amount of Imperial funds devoted to naval defence is put to far better advantage here than in any other country in the world. Whilst maintaining therefore a vigilant eye on civilian opportunists, and a careful watch over the banalities of the political mischief-maker, we may be permitted to derive some little comfort from the knowledge that those officers who are called to Whitehall to aid in naval administration are not so selected because of their inherent stupidity, their political bias, their weakness of judgment or lack of courage in execution, but because they are the cream of the finest sea-force in the world, primed with a full and detailed knowledge of their profession, sup-

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ported by a robust determination to do their duty as their wisdom and experience dictates, and filled with an intense desire to aid, in any way possible, so it be aid, the forward progress in strength, efficiency, and reputation of that naval service which is their life.

NOTE.—In all cases in the foregoing chapter, the naval estimates of the Powers referred to are those for 1912-13 as having a greater bearing upon the populations taken in the table on p. 19 and the completed fleets in the table on p. 23 than the 1913-14 estimates.

It should be remembered that the official financial year extends to different periods with different nations—that of Great Britain and Germany from April 1st to March 31st, that of France and Austria from January 1st to December 31st, that of the U.S.A. and Italy from July 1st to June 30th.

CHAPTER III

ON THE VALUE OF BIG SHIPS

IN the constant and never-ending cycle of naval constructional progress, pursuing as it does a path beset with perpetual criticism, a period is always reached when such critical comments centre around the size or the bulk of the vessels attacked. We are building to-day battleships and battle-cruisers earning at every mention in the Press such adjectives as "immense," "gigantic," "colossal," "huge," "record"—there may be other words dear to the descriptive writer not come to mind. What they mean to the student of ship-types is not quite clear. Since the days of the coracle this has been an axiom, that the big ships of to-day are the small ships of to-morrow. To the largest ships of any past period these terms have, with equal frequency, and the same lack of cogency, been applied.

The problem, therefore, to which I have to devote my attention here should perhaps be worded thus: "Are the battle-units now being constructed tending to maintain British naval supremacy, or should we, in the face of history, set back the clock and, by

building smaller ships, endeavour to thwart the natural development of type?" If I so desired I could bring cohorts of historical facts to aid me in proving that the present policy of "bigger and yet bigger" is the correct one; to these I might add battalions of strategical and tactical proofs wholly incontrovertible, and finally clinch the entire matter by a legion of technical data based on never-ending practice and experience. Such, however, is not my intention. It would serve a better purpose to visualise in brief the naval situation and then endeavour to explain how, but for our incontestable superiority in these death-dealing mastodons, it would present for us as a nation far greater and more immediate dangers than are already patent even to the meanest intelligence.

Do not let us begin by cheap sentiment and a refusal to recognise the truth; our national enemy to-day, self-made through persistence in building up a fleet beyond all arguable needs, is Germany. And Germany, unless diplomacy is more successful in the future than it has proved since the word has been of our language, will have to stop building, or—take the consequences.

This is straight talk, and both nations appreciate it. Once the facts are clearly stated the people on either side will know the better how to face the issues. Whether we are more threatened to-day than we were by the French, Dutch, and Spanish at

the hey-day of their sea-power is a moot point; nor is it very important. We *are* threatened, and we have to consider whether the millions spent in vast fighting machines is the best means of securing our future supremacy upon such a safe basis as alone has satisfied our national aspiration in the past.

In this is Germany different from all our other foes of years gone by. She lies, if not nearer in distance, nearer in very fact, to our shores owing to the development of mechanical propulsion. Thus to France even the passage of the Channel in Napoleon's time lay in the lap of the gods: to-day wind or storm avail nothing to protect this our Island Kingdom.

Now to our subject. What is a warship? It is, shortly defined, a floating means of bringing a lethal weapon into contact with the enemy. Since like creates like in mightier form to combat it (such is the law of death-dealing), war fleets grew up even as navigation progressed. First 'twas the river war-canoe; this gave way to yet larger craft meet for narrow seas and land-held water; with desire to roam farther afield, seaworthiness demanded size. The steps from the coracle to the mightiest ship designed ("mightiest" for how long?) are easier to follow than aught else that man has fashioned.

Certain inventions, great in their application though old in their inception, have marked this triumphal progress. Gunpowder, known to the

Chinese many thousand years back, invoked the gun; the gun insisted on armour; the dependence upon winds and the development of mechanics drove man to the supersedence of sail by steam. These are but a few of the many milestones punctuating a history as vivid in interest as it is unique, the history of human desire to possess the finest apparatus for robbing others of that which we all most prize—life.

Size, speed, power—these were the correlative qualities that vied in the days of wooden walls the one with the other. To them, with the introduction of armour, came “defence.” This is the war waged to-day—the never-ending battle of types. Let us consider how we have used it in regard to our natural and probable enemies during recent years. We need go no farther back than the days of the great scare preceding the Naval Defence Act of 1889 and subsequent years. It was suddenly brought home to the people of this country (a maritime folk notoriously lax in matters concerning their very existence) that the dual alliance of Russia and France possessed a paper naval power comparable in all directions to our own. “Brassey’s Annual” of that date (I take the 1890 volume for my guidance) is an eloquent testimony to the situation. My readers will accept it from me, and thereby avoid burdensome computation, that France and Russia in so far as *numbers* were concerned possessed a total of armoured ships to make us far

more nervous than ever we need be to-day about Germany—Italy and Austria (mutually hostile factors in the problem) notwithstanding. But it is to individual units I would call your attention. What had France and Russia as their best and what had we ? The following short table is most informing :—

Type . . .	France		Russia	Great Britain		
	Magenta	Formidable	Sinope	Anson	Nile	Victoria
Numbers . . .	3	2	4	5	2	2
Launched . . .	1887-90	1883-85	1886-90	1887-89	1887-88	1889
Individual Tonnage	10,581	11,400	10,200	10,500 (circa)	11,940	10,470

These were the largest effective battleships of each nation ; in fighting value, without taking exact ratios of individual strength, they were much of a kind. Does that situation exist to-day ?

How did we meet it ? We laid down immediately the eight ships of the *Royal Sovereign* class, all of 14,150 tons. Why this jump in displacement ? it will be asked. Why not vessels of parallel battle value ? The superiority in numbers would itself, it might be said, ensure supremacy. Yes, if we could be assured that the ships against which we built were a final and definite type. We knew, however, that they were superior on all points to their predecessors, and knew, too, by common-sense deduction, that their successors which our big programme would involve would themselves be great advances upon them.

Therefore we built with an eye to the future. What future? This question is easily answered. All-round superiority is ideal development, and an improved *Magenta* or *Formidable* or *Sinope* must therefore show in her completed form these main features :—

- 1, A more powerful armament ;
- 2, better protection ;
- 3, increased seaworthiness ;
- 4, greater speed ;
- 5, generally enhanced battle-value.

We must assume that every naval constructor in designing a war-vessel uses the tonnage placed at his disposal to the best advantage. A warship is a series of compromises between its component parts, and, if economically and scientifically worked out, possesses on a given displacement the maximum of all essential qualities. If, without increasing the displacement, more speed is desired, well, armour and armament or some other necessary must suffer. To obtain advances in all the first essentials of fighting craft involves, therefore, an increase of size. Hence the Royal Sovereigns, as before stated, went from the 10,500 tons or so of the *Benbow* type to 14,150 tons. Result, the Franco-Russian scare was killed for all time, and never since that date has either France or Russia entered into our naval calculations except as a possibly friendly factor.

Now let us outline the continual progress of British designs up to the time Germany in very fact entered the list. The appended table shows the types of ships, their displacement, and an explanation for

the changes in tonnage. Beneath the ship-names appear the dates of launch :—

<i>Royal Sovereign</i> . (1891)	14,150 tons	Soft unarmoured ends, unprotected heavy guns, partially protected secondary battery.
<i>Majestic</i> . . (1894)	14,900 tons	More extended protection, shielded and lighter heavy guns, secondary armament behind armour.
<i>Canopus</i> . . (1897)	12,950 tons	Improved speed but wholly inadequate belt protection.
<i>Formidable</i> . . (1898)	15,000 tons	Improved Majestics, with extended belts.
<i>Duncan</i> . . (1901)	14,000 tons	Increased speed bought at expense of much reduced side protection.
<i>King Edward VII.</i> (1903)	16,350 tons	Better protection, more powerful armament.
<i>Lord Nelson</i> . (1906)	16,500 tons	Reduced speed, but greatly increased protection, armament and battle-value.

So far for England. Let us take Germany from her early days :—

<i>Brandenburg</i> . (1891)	9,874 tons	Narrow belt, slow, unprotected secondary battery and inferior heavy guns.
<i>Kaiser class</i> . (1896-1900)	10,614 tons	Weak main armament, much better speed, narrow belt.
<i>Wittelsbach</i> . . (1901)	11,643 tons	Weak main armament, augmented secondary armament and better protection.
<i>Deutschland</i> . . (1904)	12,977 tons	Much improved main armament, better protection, stronger secondary armament.

This rough and ready tabulation shows us that, up to the Dreadnought era, German designs, in so far as displacement went, were much behind contemporary British vessels. Further examination of a few salient features justifies this conclusion.

Type . .	Wittelsbach	Deutschland	Formidable	Lord Nelson
Date .	1900	1904	1898	1906
Displacement .	11,643 tons	12,997 tons	15,000 tons	16,500 tons
Armament	4 9·4-in. 18 5·9-in.	4 11-in. 14 6·7-in.	4 12-in. 12 6-in.	4 12-in. 10 9·2-in.
Broadside fire .	2,706 lb.	4,029 lb.	4,000 lb.	5,300 lb.
End-on fire	1,488 lb.	2,367 lb.	2,100 lb.	3,220 lb.

Our *Formidable*, though older, is much in advance of the *Wittelsbach*, our *Lord Nelson* far superior to the *Deutschland*. But, say we had held to the *Formidable* type and not increased the displacement by the 1,500 tons to attain the *Lord Nelson*, how should we have stood? Are we really to believe the Germans would never have evolved a *Deutschland*? Yet her broadside and end-on fire are both superior in weight of metal to those of the *Formidable*! And so, ever onwards, creeping up towards greater things, be they of speed, hitting power or defence.

Here let me interpolate a fact or two from history. Whenever actions have been fought in the past, and where the result has depended on the *ships* and not the *men* or *Nature*, the big fellows have pulled off the victory. Useless to quote the Armada—here we won *despite* the larger Spanish units; they did not lose because of them. At Lissa it was the *men* that won the Austrians so unexpected a triumph. These well-distanced instances might be greatly multiplied. But at Santiago and Tsushima it was the battleships that told, the big ones. In any event the

last settlement is always vested in the largest ship of both sides, and there is no example known where a nation possessing solely minor units, however many in number, has successfully waged a war against another well endowed with ships of the line.

To this argument, and it is a good one, we must add others in support of the "big ship" policy; we do not build to please probable opponents. If therefore we can, by increasing the dimensions of those ships upon which victory will ultimately depend, make his path in the creation of a fleet more difficult, we have accomplished something. Very well, Germany has a very limited coast line in the North Sea and Baltic, connected by a machine-made expedient, the Kiel Canal. Her shores are bounded by shallows and reefs, narrow channels and tortuous waterways. These things are all Nature's opponents to the "big ship" idea, and Germany knows it. We have therefore led the way unhesitatingly along the line of greater size; Germany, willy-nilly, must follow, not only to maintain her national prestige, but to justify her pretensions to sea-power. For a while the compromise of greater beam and constant draught proved effective, but we are pushing Germany up to more tonnage still, as shall presently be shown. She has been compelled to spend millions on the broadening of her canal, on building new docks and enlarging old ones, on increasing the shipbuilding capacity of her private and Government yards. It may be said

that all these matters would have come about in any event—probably true; but our policy has forced her to attend to them in our time, and at our pleasure, not when she wished and at leisure.

Not that we could have prevented the coming of the Dreadnoughts, Super-Dreadnoughts, and the Super-supers yet to be. Far from it, but we might perhaps have delayed the inevitable, instead of, as now, pushing ahead of progress, rather than taking advantage of the new factors of invention as they arose. Nor are we at an end. Nothing except the depth and convenience of harbours can place a limit upon size and consequent displacement. As yet we have barely one-half the tonnage in warships that is to be found in the mercantile marine. Cost will be and is no bar; why should it be? If it cannot be met in any other way, the number of ships built will be reduced. We are spending far less to-day upon our Navy, as compared with our national wealth, than did our forefathers a century ago. Docks! some people talk of docks; how fatuous! Docks were and are built to take ships—not ships to fit docks! “Too many eggs in one basket” cry further croakers; this argument was advanced with wearisome regularity long before the *Great Harry*. Let us have done with it. To these voices crying aloud for “Moderate dimensions” (has anyone even defined this phrase?) come the complaints of the older naval constructors, filled to repletion with trust in the

ships they designed and jealous of progress beyond the powers of their day ; then, too, some of the senior officers of the fleet (more emphatic in many cases as age creeps on) call for smaller ships. Yet admirals are always the *passing* school, and I would rather hearken to the opinions of the junior striplings who have yet many a year to go ere they attain to the dignity of fleet commands. For they are the *coming* school, the men who will have to do the fighting, the men who live in the realities of the present, uninfluenced by the obsolescent actualities of the past.

As for the economists and those who prate of waste expense brought on by huge monstrosities, they and the scientists and the peacemakers and the cranks of all kinds may, conceivably, dam for a moment the tide of the inevitable, may even stem it for a decade. This is termed the "natural reaction"! But it will not and cannot last, all will go ahead upon the well-ordained lines, following the never-varying cycle, continuing the perpetual combat betwixt gun and armour, speed and stability, and all the other contentious desiderata of naval construction and technique. Discussing a recent pronouncement of that eminent naval constructor, the late Sir William White, a writer in the *Naval and Military Record* summed the matter up in a manner deserving of quotation :

"The mention of a particular nation will doubtless

be pardoned in view of the recent openness of the First Lord, after whose speeches there can be no harm done in repeating the fact that our naval policy, expansion or contraction, depends entirely upon that of Germany. Now, every year, Germany sets apart a certain sum for shipbuilding. It does not matter whether she spends the money in 24,000-ton Dreadnoughts, as she is doing at present, or whether she prefers to build 12,000-ton ships at two-thirds of the cost. Whether she pays a million or a million and a half for her ships, she is getting what she considers to be good value for her money. That being the case, does it matter from the financial point of view what sort of ship we build in reply? Sir William White suggests that a reduction should be made in the number of gun-stations—that is to say, turrets—with which ships are equipped; but what would that mean?

“Germany’s next batch of ships to pass into service will be armed with ten heavy guns in five turrets, all bearing on either broadside. Under the policy laid down in Mr. Churchill’s speech on the Estimates we should build so as to secure and maintain a 60 per cent. advantage over Germany; but it is obvious that it would be of no use to secure this advantage in numbers if our ships carried only six guns apiece in three turrets. It would mean that apart altogether from the 60 per cent. margin, we should have to build five 6-gun ships for every three of Germany’s 10-gun

vessels, and the larger number of small vessels would cost considerably more to build and maintain than the smaller number of large ones. What we have to maintain is not a certain number of ships, but a certain aggregate power, and it is beyond argument that power is more cheaply obtained in large ships than in small."

On the score of individual cost we stand largely to gain by the big ship. We still are the premier shipbuilders of the world, and not only are the vessels turned out superior at all points to foreign contemporaries, but they are far cheaper upon whatever basis the matter of cost be applied. Leaving out the *Dreadnought* herself—she was experimental, and her cost, as subsequent vessels showed, cannot be accepted as a criterion of the type—we build to-day from 10 per cent. to 40 per cent. per ton cheaper than any other first-class power. Observe the following:—

		Tons	Cost	= Per ton
Great Britain	<i>Collingwood</i> (1908) .	19,250	£1,731,600	£89.9
	<i>Neptune</i> (1909) .	19,900	1,715,250	86.1
	<i>Monarch</i> (1911) .	22,500	1,886,900	83.8
	<i>Lion</i> (1910) .	26,350	2,068,350	78.4
Germany	<i>Nassau</i> (1908) .	18,600	1,840,000	98.9
	<i>Ostfriesland</i> (1909) .	22,440	2,304,300	102.7
	<i>Moltke</i> (1910) .	22,632	2,380,000	105
France	<i>Courbet</i> (1911) .	23,095	2,603,960	113
Austria	<i>Viribus Unitis</i> (1911)	20,000	2,525,000	126.2

We then come to the question of individual strength. It is necessary, tactically and strategically, that we should be able to place in our foremost

line at all times a division of battle-units far superior individually to the finest ships possessed by a possible enemy. Mere numbers will not compensate for failure to recognise this essential; we live in a day of machinery when every invention tends the more to submerge the human element. This element will, of course, remain, but the wise Briton will leave nothing to chance, and will regard the personnel of all navies against which he may reasonably be called upon to fight as possessed of stamina, pluck, and national spirit comparable to his own.

This law of always having a number of immeasurably superior ships to place in the forefront of the battle-array has been faithfully followed since the Naval Defence Act of 1889. Before Germany had really thought of any effective battle-fleet we had our Majestics and Royal Sovereigns, seventeen ships of 14,150 to 14,900 tons, in commission. While she was launching her ten Kaisers and Wittelsbachs of 10,614 to 11,643 tons, we were setting afloat our twenty Canopus (12,950 tons), Duncan (14,000 tons), and Formidable (15,000 tons). She proceeded to the ten Deutschlands of 12,997 tons; we went to 16,350 tons in the eight *King Edward VII.* class, and the 16,500 tons of the *Lord Nelson*. Then our Admiralty learned of a German design of about 16,000 tons and mounting six 11-inch guns paired along the centre line—these were to follow the Deutschlands. Yet the year that saw the launch of the last Deutschland

witnessed also the launch of our *Dreadnought* of 17,900 tons ; in the result, the German 16,000-ton design never eventuated. They saw they were playing a stupid game and must go higher.

They therefore laid down the *Nassau* and *Westfalen*. The foolish Teuton folk hailed the *Dreadnought* as a boon and a blessing ; it enabled her, we were told (largely also by our own people, curiously enough) to start on even terms once again with *perfidious Albion* and dire consequences were freely prophesied. Such an idea could only carry weight with those scatter-brains who believed that on the day the *Dreadnought* was commissioned all her predecessors would be condemned as inefficient and obsolete, fitted only for the sale list. Yet when now, in the merry year 1913, there are ships flying the pennant with far greater superiority on all points over the *Dreadnought* than she displayed as against those she succeeded, much abused pre-Dreadnoughts of the *Lord Nelson*, *King Edward VII.* and *Formidable* classes are making and will long continue to make a brave and proper show in leading battle-squadrons of the Empire.

To return to Germany's first big jump in displacement, a jump brought about by our insistence on maintaining a lead in the finest ships. They show an advance over their predecessors of 5,000 tons in displacement, and lack of experience has resulted in practical disaster ; the quartette are Dreadnoughts

in name only! They exceed their draught by from two to four feet; they are so cramped that four officers sleep in one cabin. These are but two details of condemnation.

	Lord Nelson	Nassau	Dreadnought
Designed Displacement.	16,500 tons	18,600 tons	17,900 tons
Designed Horse-power .	16,750	20,000	23,000
Designed Speed . . .	18·5 knots	19·5 knots	21 knots
Armament, Main . . .	4 12-in. B.	12 11-in. B.	10 12-in. B.
	10 9·2 in. B.		
Broadside Fire . . .	5,300 lb.	6,084 lb.	6,800 lb.
End-on Fire . . .	3,220 lb.	4,562 lb.	5,100 lb.

And the *Nassau*, the first German ship of the Dreadnought era, was not commissioned until May 3rd, 1910, whilst the *Dreadnought* herself, commissioned in 1906, had by that time been joined by nine sisters! The realisation of the hard and unpleasant fact in the very patent inferiority of their design came as a most painful shock to the German people. How did they meet the case? They increased the calibre of the guns, but maintained their absurd disposition, which permitted but eight of the total of twelve to fire on both broadsides. These four vessels, the *Ostfriesland*, *Thüringen*, *Helgoland*, and *Oldenburg*,

	Ostfriesland	Neptune
Displacement . . .	22,440 tons	19,900 tons
Designed Horse-power .	25,000	25,000
Designed Speed . . .	20·5 knots	21 knots
Armament, Main . . .	12 12-in. B.	10 12-in. B.
Broadside Fire . . .	7,848 lb.	8,500 lb.
End-on Fire . . .	5,886 lb.	5,100 and 6,800 lb.
When Commissioned .	September, 1911	January, 1911

were beaten in advance by the commissioning of our Neptunes and Orions. To the first of these they may well be compared.

Encore un coup manqué ! The latest German type afloat, all five of which are expected to be commissioned during this financial year, is the *Kaiser* class. We shall have a dozen Orions, King George V., and Iron Dukes in commission by then. Just see one of them paralleled beside the *Kaiser* :

	Kaiser	K. George V.	Q. Elizabeth
Displacement . . .	24,310 tons	23,000 tons	27,500 tons(est.)
Designed Horse-power . .	28,000	31,000	53,000 (est.)
Designed Speed . . .	21 knots	21·5 knots	25 knots (est.)
Armament, Main . . .	10 12-in. B.	10 13·5-in.	8 15-in.
Broadside Fire . . .	9,810 lb.	14,000 lb.	15,600 lb.
End-on Fire . . .	5,886-7,848lb	5,600 lb.	7,800 lb.
When Commissioned	Dec. 1912	Nov. 1912	Oct. 1914

The *Queen Elizabeth* is put in as showing the latest British type in preparation for any German developments of 1915, of which at present we have not complete cognisance. Applying the same methods to battle-cruisers, we outdistanced the *Von der Tann* with our *Invincible* class, and the *Moltke* and *Goeben* could neither fight nor run away from our *Lion* type ! A situation, surely, full of excessive chagrin and national discomfort.

Now let us see, in conclusion, how we compare in the matter of figures at various periods during the next few years. To-day (July, 1913) we have twenty-six ships ready for action (to be followed in

COMPARATIVE STATEMENT OF BRITISH AND GERMAN NAVAL ADDITIONS
1914-1917

A. On March 31st, 1914; end of the British financial year			
British Empire	16 ships with 12-in. guns 14 ships with 13.5-in. guns	Germany	8 ships with 11-in. guns 9 ships with 12-in. guns
Total	30	Total	17
B. On March 31st, 1915			
British Empire	16 ships with 12-in. guns 16 ships with 13.5-in. guns 4 ships with 15-in. guns	Germany	8 ships with 11-in. guns 13 ships with 12-in. guns
Total	36	Total	21
C. On March 31st, 1916			
British Empire	16 ships with 12-in. guns 16 ships with 13.5-in. guns 10 ships with 15-in. guns	Germany	8 ships with 11-in. guns 15 ships with 12-in. guns 3 others
Total	42	Total	26
D. On March 31st, 1917			
British Empire	16 ships with 12-in. guns 16 ships with 13.5-in. guns 17 ships with 15-in. or other guns	Germany	8 ships with 11-in. guns 15 ships with 12-in. guns 5 others
Total	49	Total	28

a week or two by another pair) to fifteen for Germany. On previous page are shown further totals.

Individually our ships are, at any given date, finer battle-units than those possessed by Germany. But there are not enough of them. Just as numbers cannot make up for lack of quality, so individual strength cannot make up for lack of numbers. We must have both, for we have national interests beyond the usual, and comparable to those of no other Power. These it behoves us never to leave unprotected, or even with a suggestion that the protection given is inadequate. So whilst preening ourselves not a little upon our undoubted constructional powers, emphasised the more as the size of warships increases, let us not be blind to the danger of the future. Good ships are good ; an unapproachable total of them is better. This we have to-day as the result of forethought three years ago ; but to-morrow, the to-morrow of three years hence, how shall we be placed ? Who will be the first man to adopt as a national policy of naval safety a standard based on the possession of two completed ships constructed since the Dreadnought era to every one possessed by the next strongest Sea Power ? I will not prophesy, but I think the more.

CHAPTER IV

ON THE "DREADNOUGHT" TYPE

PART I.—The Advent of the Dreadnought

EVERY student of the evolution of ship-type since the introduction of the armour-clad warship recognises that, beneath the extreme divergences of size, speed and, indeed, the minutiae of design, there can be traced in each successive period a distinct cycle of development in which only some change of premier magnitude (comparable to the substitution of metal for wood as the material of ships' hulls) can make a break. One governing factor is the endless battle between gun and armour—the second, though not as potent in its ultimate effects, the advances made in subsurface warfare, whether in the improvement of submarines or torpedoes.

It is not convenient, nor is it necessary, historically to trace here the intervening ship-types from the *Warrior* of 1861 to the *Queen Elizabeth*, just off the stocks, but this much may be set out, that at certain periods during the last half-century public and expert opinion has rebelled against two things, (1) the size

of warships, basing their primary objections to further increase on the "too many eggs in one basket" theory, and (2) their cost. Let me first try and explain as shortly as possible why and how this time has come in the past, and must inevitably come again in the future. We are, for the nonce, dealing with armour *v.* gun. The competition betwixt the two is never-ceasing, and you have but to settle on any period since 1860 and choose the vessel with impenetrable armour to be assured that, glancing a few years ahead, there will have been built a ship carrying weapons capable of piercing it. Possibly the size necessary to attain this result and the desire—always latent—not to exceed certain limits of cost and tonnage, will have produced a ship not vastly larger but carrying fewer and mightier guns. To meet this ship another with thicker and improved armour is next designed—and obviously her weapons must not be inferior to those of her antagonist.

More tonnage, more cost, inevitably follow, yet the contest is not ended. What, then, induces a sudden reaction? The answer is simple. Metallurgical and mechanical advance is found one day to have been overstepped by the ingenuity of the designer, who, in his enthusiastic desire always to go one better, has got ahead of progress—a faulty 16·25-in. gun is the result, or a ship with a patch of armour on a part only of her hull, leaving the major portion of it unprotected—these are merely instances. Again,

the introduction of the wire-wound breech-loader provided on a lesser weight a far more potent weapon than had previously been mounted. Such examples might be multiplied; these are sufficient to point this corollary, that advance in any one direction is the result of the necessity of counteracting advance in another.

There are moments when a specific development in the art of war (call it "invention," if you will) is stated confidently as ending this or that class of vessel, altering this or that theory, creating this or that complication—yet the march of science has never failed to find an effective antidote to such development, and no innovation so far has long retained the pride of place. The submarine may be cited as the most startling example—at its appearance battle-ships were to disappear and British naval supremacy to pass into the records of history. Yet to-day we lead the world in under-water craft!

We reach, therefore, the *Dreadnought*. In 1905 a Committee on Designs was appointed, and in the First Lord's Statement for 1906-7 appeared the following note: "The Committee on Designs . . . considered the various designs and settled the type of battleship to be laid down during the financial year 1905-6. This battleship, *Dreadnought*, is being supplied with turbine machinery on the Parsons system, and was laid down at Portsmouth on October 2nd, 1905, and launched on February 10th by His

Majesty the King." Let it be added, she was commissioned on December 11th, 1906, or within sixteen months of being commenced. Her completion was made the occasion for the most remarkable campaign of advertisement ever known in the history of ship-building—it was, indeed, "the *Dreadnought* day by day" from Land's End to John o' Groat's. She was, so we were all told (and told yet again) the largest warship ever conceived, a complete revolution both in design and theory, a record breaker in battleship-speed, unique in appearance in that she had tripod masts, the first single-calibre ship (she carried no secondary armament as hitherto understood), and, finally, she was so vast an advance in every direction that she drove all her predecessors into an early and lamented obsolescence. Accepting this last cry with avidity, the pessimists claimed that the Admiralty had done a very wrong and unpatriotic thing in initiating this new era in design, in that every other nation could now place itself on level terms with ourselves if wisdom dictated to them the immediate imitation of our policy.

But what was the *Dreadnought* really? In a sentence, she was her predecessor in that name (launched in 1875) brought up to date—nothing more; she was the natural single-calibre battleship of the period.

During the last ten years there had been a conviction growing in the minds of those interested in naval matters that the multiplication of war functions

in a single hull was a mistake. In the old days a battleship, by reason of the fact that she carried a secondary armament, could, given sufficient speed, undertake the functions of cruiser as well as battleship. She carried mines—she was therefore also a mine-layer; to-day certain types of ships perform certain types of functions. Indeed, simplicity is the basis of naval development. A ship, however, is merely a floating platform for the transportation of guns to the scene of battle. It is to those guns, and their bearing upon the work they will be called upon to do, that the critic must direct his attention. The essence of successful gunnery, once precision has been attained, is "fire control," and it is impossible adequately to perform this all-important function without careful "spotting," that is to say, the instantaneous yet precise observation of the effect of the projectile discharged upon the mark aimed at. Obviously if a broadside fired into an enemy is composed of shot and shell of many and varying sizes, the effect of the discharge cannot properly be gauged. The result of this gunnery axiom was found in the *Dreadnought*, where the primary and secondary armaments were merged into one. The acceptance of this axiom, too, dispelled for all time from the minds of the vast majority of naval officers and others interesting themselves in the question, any regard for a secondary battery as a supporting factor to the primary weapon. We are thus left with the big

guns and the little guns with no medium weapons intended either to aid the former or supplement the number of the latter. In short detail, the *Dreadnought* displaces 17,900 tons, has a designed speed of twenty-one knots and an armament of ten 12-in. guns and two dozen twelve-pounder quick-firers for use against torpedo-craft.

Without going into the merits or demerits of the advertisement she invoked, which, it may be said, was far more spontaneous than, as has often been stated, by official suggestion, let us first see to what extent she justified the encomiums she called forth and whether her creation was to us a folly or a benefit. She was, to begin with, not the largest warship laid down—Japan had (as was perfectly well known) commenced the *Aki* of 19,780 tons on March 15th, 1905, and on May 15th the *Satsuma* of 19,250 tons was commenced. She was not a complete revolution in ship design—except in so far as she differed entirely from her immediate predecessors, the *Lord Nelson* and *Agamemnon*. Taking her armament—the single-calibre-no-secondary-armament ship had been introduced into our Navy in the *Cerberus* (1868), *Devastation* (1871), and *Dreadnought* (1875). She carried more than four heavy guns—true, but the Russian *Sinope* class, twenty years previously, and the German *Brandenburg* class (contemporaries of our *Royal Sovereign*) had each mounted six big weapons ; that she carried ten was merely wise utilisation of

the larger displacement necessitated by engineering and constructional considerations. Dealing with her engines—the turbines in her were no novelty; they represented steady evolution. They had been tried first in destroyers successfully, next in a cruiser, also successfully, and went thence in natural sequence to the battleship. After all, oscillating engines were replaced by the slide-valve type, and these gave way in time to triple and quadruple expansion machinery, and yet no outcry was raised of revolution! She was a record breaker in speed, we were told—yet the Italian battleship *Sardegna*, of 13,640 tons and launched in 1890, had attained 21·8 knots on trial! But this point we concede: the *Dreadnought* was unusual in appearance, though even tripod masts had been tried in, amongst other vessels, the ill-fated British battleship *Captain* of 1871, and the three Japanese cruisers of the *Matsushima* class. All of which reiterates the aged axiom that nothing is new under the sun.

Yet, having disposed of the inanities of comment to which she gave rise, it must at once emphatically be stated that in her *tout ensemble* the *Dreadnought* represented a perfection of battleship type reflecting unusual credit on our constructive department. She was the embodiment of simplicity, the summit (at that time) of general fighting efficiency, and a remarkable instance of all-round development of type.

Her world-wide acceptance as a unique product stimulated to a degree without precedent the spending fever of foreign Admiralties, and this fact it was that led to the condemnation of our Admiralty for their splendid initiative. Could they have delayed by a year, even, the advent of the single-calibre capital-ship ? To this question let others furnish an answer. In 1902, in a discussion at the Royal United Service Institution, Lord Charles Beresford said : " We have too many sorts of guns in our ships. I was talking the matter over to my Commander-in-Chief (Lord Fisher of Kilverstone) the other day, and he used the best expression I have ever heard on the point. He said : '*What we want in our ships is the biggest smallest gun and the smallest biggest gun.*' I entirely agreed with him. I would have those two laid down in the ships and not have the great diversity of armament that we have at present."

Only in 1912 was the official statement made by the United States Navy Department that *an all-big-gun ship was designed over a twelve-month before the " Dreadnought."* The following extract from an article on German naval progress, in the 1910-11 issue of the " Navy League Annual," speaks for itself : " Our commentators on the international naval situation at the dawn of the Dreadnought era never fail to describe with gusto the consternation evoked in Germany by this example of British enterprise. There was, indeed, surprise, and even consternation

at the advent of the all-big-gun battleship, but it may not be generally known how nearly—to use a colloquialism—the boot was on the other leg.

“In the autumn of 1904 Germany was preparing an equal surprise for her neighbours. The inclusion of 9·2-in. weapons in the *King Edward* class, followed by the total substitution of the 6-in. quick-firer by the 9·2-in. gun as secondary armament in the *Lord Nelson* and *Agamemnon*, brought home to Germany the urgent necessity of also departing from regulation battleship ideals. As a result, plans were prepared of a new type of battleship, the following details of which, new and interesting as they may be to many, have the additional merit of authenticity. The displacement was of 16,500 tons, or a fraction less than the *Lord Nelson*, while the designed horsepower was almost identical. Six 11-in. 40-calibre guns constituted the primary armament, mounted in three double turrets on the centre-line after the *Brandenburg* system, save that the middle turret had a greatly extended arc of fire. Twelve 6·7-in. guns, six mounted on the upper and six on the main deck, completed the tale of heavy weapons, and twenty 24-pounders the tertiary armament. Had such a vessel actually been built, *she would have represented almost as great an advance over previous types as did the ‘Dreadnought’ at a later date.*”

Then we have the testimony of Rear-Admiral Motoki-Kondo, Inspector-General of Japanese Naval

Construction, who, in a paper he read on July 5th, 1911, before the Institute of Naval Architects, made the following significant statement :

“ One is apt to attach too much importance to the experiences gained during the war. No doubt much valuable information was obtained in tactical and strategical matters, though even there, I fear, much has been left unsolved. In naval construction, at any rate, I find that many questions we were anxious to have solved by war experience remain unsolved to this day. When we come to consider the number of times that actual battles took place during nearly a year and a half that the hostilities continued, we can easily understand that it is impossible that all the innumerable possible cases should take place. It is true that we have received confirmation of what we deemed most probable, which we could never have ascertained in peace time, but in the main it is safe to say that no new lessons have been learned by the war to revolutionise the art of naval construction. *The ‘Dreadnought’ is but the logical outcome of the progress of naval construction, and that type would have been arrived at sooner or later, even if the war had never taken place.*”

Finally, General Vittorio Cuniberti, the talented Italian designer, prepared drawings as long ago as 1903 for a fast battleship to carry an armament of twelve 12-in. guns. To sum up, all the chief Naval Powers saw and appreciated the trend of modern

thought and ideas, yet feared (recognising the inevitable cost) to be the first to set the pace. As a clap of thunder from a summer sky came the move of the British Admiralty—the great step (and yet a natural one) had been taken, and with it the competition in armaments took on new life.*

And this under the belief that all started level in the race for sea-power—never was more woeful a misconception.

PART II.—The Result

The heading here is quite in order, for we have, in the short space of seven years, shaken down to normal practice once again; the race is over, many ambitions are shattered, much money has been spent, and still Britannia Rules the Waves.

By a trick of fate, the entry of the *Dreadnought* into the fleet synchronised with the *débâcle* at the polls of the Conservative Party. The outcome of this was the dragging of our first and only line of defence into the arena of party politics, and the initiation of a series of scares based—it is well to speak plainly—upon the flimsiest foundation. For the direct result of the *Dreadnought* was the temporary cessation of progress on foreign programmes whilst designs were being redrafted to meet the new ideas.

* Professor Biles has stated (Institute of Naval Architects, 1913) that the designs for a single-calibre battleship were placed before the British Board of Admiralty in the early nineties of the last century.

These delays could not pass unrecognised by our authorities in this country, and a series of meagre programmes followed, for which the poor discrimination of a misled public at once blamed the Liberal Party who, willy-nilly, have bonded to themselves the fanatics of economy and the cranks of Peace-At-Any-Price. This, too, when Germany was promoting an immutable Naval Law, under which as many as four large armoured ships in one year were provided—which to the aforesaid misled public suggested laid-down and speedily built. Observe what the programmes were from the year the Liberals took office to the days of the great naval scare :

	1906	1907	1908	Total
Germany . . .	2	3	4	9
Great Britain . . .	3	3	2	8
U.S.A.	2	2	2	6

Who would not be frightened at the contemplation of such figures ?

Now, when the Liberals assumed office it became necessary to redeem the flatulent promises of retrenchment so much the stock-in-trade of that party on public platforms. Already their predecessors had reduced the Naval Estimates of 1904-5 from £36,859,681 to £33,151,841 in the following year. Yet the Government back-benches cried aloud for further relief and they must have their way—so the relief was granted them. In 1906-7 the total fell to £31,472,087,

and in 1907-8 it showed a still further, though very slight, reduction to £31,419,500. The economists were enthusiastic in their praise of the then First Lord of the Admiralty and looked forward to even better things. Alas! the next year brought an increase, the awful total standing at £32,319,500. At once two things happened. The Liberals virulently attacked the Government for extravagance—the Conservatives equally warmly assailed them for their inadequate programme of but two armoured ships. Then began a period of charges and counter-charges which led up to one of the most portentous pieces of Parliamentary humbug ever practised on the electorate. The Prime Minister (Mr. H. H. Asquith), the Secretary of State for Foreign Affairs (Sir Edward Grey), and the then First Lord of the Admiralty (Mr. McKenna), vied the one with the other in their endeavours to make our patriotic flesh creep—the Machiavellian cunning of the dastard Germans was held out to us as a sword of Damocles suspended above our national existence, and the whole scene was staged in an atmosphere of serious and vivid apprehension that could only be justified by a fear of immediate international complications. Why was it all done? For no other reason than to stifle criticism from their own supporters of the 1909-10 Estimates, which had made a sudden and violent rise to £35,142,700, and to bring them to heel in support of the scare programme of eight

capital-ships necessitated by the encouragement their former meagre provision had given to possible opponents. There is no parallel in all history for such political chicanery.

The debate which followed was unique—the Hansard for that day contains a greater medley of palpable misstatement and ridiculous false calculation than has ever before burdened a similar number of pages. The Opposition perforce took the three Ministers at their word—and rubbed the situation in with healthy and permissible vigour. The game developed apace and the novel feature of discovering “years of greatest danger” entered into the problem; unfortunately for the success of this speculative side-issue, the passage of time necessitated a constant revision of any date chosen! At the moment, the idea is rather out of favour, since in the first periods cited, i.e. the springs of 1912 and 1913, hard fact showed that not only had we the Two-Power-Standard in its highest sense, but we even nearly met the

	1909	1910	1911	1912	1913	Total
Germany . . .	4	4	4	2	3	17
British Empire .	8	5 and 2 Colonials	5	4	5 and 1 Colonial	30
U.S.A.	2	2	2	1	1	8

wiser and more comprehensible ideal of Two-Keels-to-One of the next strongest Power. How has this all come about? This question is answered in part a little later, where the progress of Germany is analysed,

but in part, too, it may be found in the comparison of the armoured programmes *since* 1908.

Add to these figures the salient fact that our vessels are built in round about two years, the German and American ships in *circa* three years, and the reason of our present comparatively satisfactory position is explained.

PART III.—The International Position To-Day

How many capital-ships have been built, laid down or projected since the initiation of the Dreadnought era ? The acceptance of any computation is dependent upon agreement as to what constitutes "commencement" and "completion." Obviously, the only fair basis is that of a common standard for all nations. To give an example. A perpetual naval pessimist came to me on Monday, July 3rd, 1911, and handed me a press cutting with the words, "Look—another German Dreadnought completed !" The cutting I have before me : "July 2nd, Sunday. The Dreadnought battleship *Thüringen* was commissioned for trials yesterday by Captain Nordheim." A foot-note stated "since this super-Dreadnought * was laid down on January 1st, 1909, she has only been thirty months under construction."

Daily explanation of this sort of thing is now a morbid habit with me—the pessimists are so very

* Of course she is not a super-Dreadnought—she would be blown to smithereens in ten minutes by one of the British *Orion* class, the real super-Dreadnought.

pessimistic. Let us trace the life history of the *Thüringen*. She is one of three battleships provided under the 1908 programme of the German Naval Law ; she was ordered from the Weser Yard, Bremen, on June 20th, 1908, and should, for so the law provides, have been commenced in July of that year ; work was in effect started on her six months later, on January 1st, 1909 ; she was launched, after being eleven months on the stocks, on November 27th, 1909 ; she was, according to official data, to have been ready for service *with the fleet* on June 20th, 1911, which the careful mathematician will note makes thirty-six months from the date of order ; she was, in fact, only commissioned for trials on July 1st, as already stated, and was eventually commissioned for service with the fleet on September 10th, 1911. Thus the true time taken in her building is about thirty-three months ; but what becomes of the six months' delay in commencement ?

It is argued not infrequently that a ship that goes on trial is *practically* complete for war. Granted, but if this be the case, the British *Neptune* was ready on September 7th, 1910, when her trials began, i.e. under twenty months from the day of commencement ! The same applies to the *Colossus* and *Hercules*, her sister-ships, and all others of their kind in our fleet. Therefore it is I consider a ship to be *commenced* when her keel-plate has been laid upon the slips, and she is *finished* when she commissions as

THE "DREADNOUGHT" TYPE 63

an integral part of a nation's fighting force. Only this basis of calculation is reasonably exact.

DEFINITION OF DREADNOUGHT. — Next, what is a Dreadnought? We know the name-ship well enough, but the features essential to inclusion in the genus are not commonly understood. It lies purely and solely in the main or heavy armament. A Dreadnought, then, *proprement dit*, is a ship with a numerous battery of heavy guns of identical calibre and mounting nothing between them and the quick-firing weapons intended for defence against torpedo-craft. But many vessels, yclept Dreadnought, do not fulfil this condition—the French Dantons, the Japanese Satsumas amongst others; the reason is

	I	II	III	IV
Date of Launch . . .	1906	1906	1911	1907
Displacement . . .	16,000 tons	16,500 tons	15,480 tons	18,027 tons
Designed I.H.P. . .	16,500	16,750	15,300	22,500
Designed Speed . . .	18·5 knots	18·5 knots	19·5 knots	19·25 knots
Armour, Belt . . .	11 in.	12 in.	9 in.	10 in.
Armour, Big Guns . .	10 in.	12 in.	10 in.	12 in.
Armament . . .	8 12-in. B.	4 12-in. B.	8 12-in. B.	4 12-in. B.
	—	10 9·2-in. B.	—	12 9·4-in. B.
	22 3-in. Q.	24 3-in. Q.	20 4-in. Q.	16 3-in. Q.
	16 smaller	5 smaller	6 smaller	8 smaller
Torpedo Tubes . . .	2	5	3	2
Coal, normal tons . .	900 tons	900 tons	800 tons	925 tons
Coal, maximum . . .	2,200 tons	2,500 tons	1,900 tons	2,010 tons
Complement . . .	689	747	700	900
Weight of Broadside .	6,800 lb.	5,300 lb.	6,800 lb.	6,322 lb.
Weight of Astern Fire .	3,400 lb.	3,220 lb.	5,100 lb.	3,568 lb.
Weight of Ahead Fire .	3,400 lb.	3,220 lb.	5,100 lb.	3,568 lb.
Total Fire . . .	6,800 lb.	7,200 lb.	6,800 lb.	8,764 lb.

not far to seek—they are such powerful developments of the pre-Dreadnought type that they are in every way comparable to the new idea. My meaning is made clearer by the comparative parallels given above. These give the most important data of four entirely different

ships which I have designated I, II, III, and IV—and I ask my readers to study them with some care.

Only an expert could state which of these are included as Dreadnoughts and which not. No. I is the United States *Michigan*, III the Spanish *Espana*, IV the French *Voltaire*—these are Dreadnoughts as the world sees them; No. II is the British *Lord Nelson*—she is a pre-Dreadnought! Whilst the above comparisons paradoxically make confusion worse confounded and at the same time clear up the controversy, they also show how gentle has been the change from pre-Dreadnought to Dreadnought in the matter of fighting-value, and this is the primary and true test of battleship strength.

SPEED IN CONSTRUCTION.—Much capital was made out of the theory propounded by Mr. McKenna and amplified by the Prime Minister, that Germany can build as fast as we can. Yet this bare statement has nothing fearful in it—probably France, Japan, Austria, the United States or other Powers can do the same; only—they have not done so up to the present, and there are no signs of a start in that direction being made. Moreover, certain of them, as shall be set out, are merely piling up back-work on to delayed present work. The table on p. 65 is instructive. A is from the day of actual laying down to launch, B from date of actual laying down to completion.

Ah! my critics, look at the 35·56 months for Germany! But two of these were twelve months

	A		B	
	Number of Ships	Average in Months	Number of Ships	Average in Months
British Empire . .	29	10.52	27	27.33
Germany	21	15.407	14	35.56
U.S.A.	10	13.5	8	33.33
France	12	15.42	8	41.96
Japan	6	19.08	5	49
Russia	4	26	Nil	
Italy	6	13.35	1	43.5
Austria	3	13.16	2	30.25

late in commencement, one ten months, one six months, and several of them as much as four months, whilst two caused endless commotion throughout this country because they were actually commenced three months or so prior to the official order being given. I may make this comment, perhaps, that if the German ships are to be a year late in commencement I don't object to their being built in twenty-four months! It levels up. Our average is over twenty-seven months because the contract period of construction for the three Invincible battle-cruisers and the *Australia* and *New Zealand* was thirty months. Russia, Italy and Austria are largely unknown quantities, but their past performances give little promise for the future. We will now take the Naval Powers indulging in the Dreadnought luxury in their order of precedence.

BRITISH EMPIRE.—On the next page is a list of the vessels in commission; on p. 67 a list of those launched, but not yet in commission.

WHAT OF THE NAVY?

BRITISH DREADNOUGHTS AND BATTLE-CRUISERS IN COMMISSION

	Name	Displacement in Tons	Designed I.H.P.	Trial Speed in Knots	Armament		When Laid Down	When Launched	When Commissioned for Service
					Main	Secondary			
1	<i>Dreadnought</i>	17,900	23,000	22.4	10 12-in. B.	24 3-in. Q.	Oct. 2, 1905	Feb. 10, 1906	Dec. 11, 1906
2	<i>Indomitable*</i>	17,250	41,000	28.7	8 12-in. B.	16 4-in. Q.	Mar. 1, 1906	Mar. 16, 1907	June 25, 1908
3	<i>Inflectible*</i>	17,250	41,000	28.4	8 12-in. B.	16 4-in. Q.	Feb. 6, 1906	June 26, 1907	Oct. 20, 1908
4	<i>Invincible*</i>	17,250	41,000	28.0	10 12-in. B.	16 4-in. Q.	April 2, 1906	April 13, 1907	Mar. 20, 1909
5	<i>Bellerophon</i>	18,800	23,000	22.1	10 12-in. B.	16 4-in. Q.	Dec. 8, 1906	July 27, 1907	Feb. 20, 1909
6	<i>Temeraire</i>	18,800	23,000	22.74	10 12-in. B.	16 4-in. Q.	Jan. 1, 1907	Aug. 24, 1907	May 15, 1909
7	<i>Superb</i>	18,800	23,000	21.62	10 12-in. B.	16 4-in. Q.	Feb. 6, 1907	Nov. 7, 1907	June 9, 1909
8	<i>St. Vincent</i>	19,250	24,500	21.9	10 12-in. B.	20 4-in. Q.	Dec. 30, 1907	Sept. 10, 1908	May 3, 1910
9	<i>Coltishwood</i>	19,250	24,500	22	10 12-in. B.	20 4-in. Q.	Feb. 3, 1908	Nov. 7, 1908	April 13, 1910
10	<i>Yamaguchi</i>	18,750	43,000	22.4	10 12-in. B.	20 4-in. Q.	Feb. 2, 1908	Feb. 22, 1909	Mar. 1, 1910
11	<i>Indefatigable*</i>	19,000	25,000	22.13	8 12-in. B.	16 4-in. Q.	Feb. 23, 1908	Oct. 28, 1909	Feb. 24, 1911
12	<i>Neptune</i>	20,000	25,000	22.7	10 12-in. B.	16 4-in. Q.	Jan. 19, 1909	Sept. 30, 1909	Jan. 11, 1911
13	<i>Colossus</i>	20,000	25,000	22.4	10 12-in. B.	16 4-in. Q.	July 8, 1909	April 9, 1910	Aug. 8, 1911
14	<i>Heraules</i>	20,000	25,000	21.91	10 12-in. B.	16 4-in. Q.	July 30, 1909	May 10, 1910	July 4, 1911
15	<i>Orion</i>	22,000	27,000	22.31	10 12-in. B.	16 4-in. Q.	Nov. 29, 1909	Aug. 20, 1910	Jan. 2, 1912
16	<i>Lion*</i>	26,350	70,000	31.78	10 13.5-in. B.	16 4-in. Q.	Nov. 29, 1909	Aug. 6, 1910	June 4, 1912
17	<i>Princess Royal*</i>	26,350	70,000	32.7	8 13.5-in. B.	16 4-in. Q.	May 2, 1910	April 29, 1911	Nov. 14, 1912
18	<i>Conqueror</i>	22,500	27,000	23.13	10 13.5-in. B.	16 4-in. Q.	April 11, 1910	May 1, 1911	Nov. 23, 1912
19	<i>Monarch</i>	22,500	27,000	21.88	10 13.5-in. B.	16 4-in. Q.	April 1, 1910	Mar. 30, 1911	April 16, 1912
20	<i>Thunderer</i>	22,500	27,000	21.45	10 13.5-in. B.	16 4-in. Q.	June 18, 1910	Feb. 1, 1911	June 15, 1912
21	<i>Australia*</i>	19,200	44,000	26.89	8 12-in. B.	16 4-in. Q.	June 23, 1910	Oct. 25, 1911	June 16, 1913
22	<i>New Zealand*</i>	18,800	44,000	26.38	8 12-in. B.	16 4-in. Q.	June 20, 1910	July 1, 1911	Nov. 23, 1912
23	<i>King Georges V.</i>	23,000	31,000	22.12	10 13.5-in. B.	16 4-in. Q.	Jan. 16, 1911	Oct. 18, 1911	Nov. 16, 1912
24	<i>Centurion</i>	23,000	31,000	21.88	10 13.5-in. B.	16 4-in. Q.	Jan. 16, 1911	Nov. 18, 1911	May 14, 1913
25	<i>Adica</i>	23,000	31,000	22.47	10 13.5-in. B.	16 4-in. Q.	Mar. 27, 1911	Mar. 21, 1912	Aug., 1913
26	<i>Queen Mary*</i>	27,000	75,000	28.16	8 13.5-in. B.	16 4-in. Q.	Mar. 6, 1911	Mar. 20, 1912	

NOTE.—An asterisk after a vessel's name denotes a battle-cruiser as distinct from a battleship.

BRITISH DREADNOUGHTS AND BATTLE-CRUISERS LAUNCHED, BUT NOT YET
IN COMMISSION

Name	Displacement in Tons	Designed I.H.P.	Designed Speed in Knots	Armament		When Laid Down	When Launched	
				Main	Secondary			
27 <i>Audacious</i> ..	23,000	31,000	21.5	10 13.5-in. B.	16 4-in. Q.	Mar. 23, 1911	Sept. 14, 1912	1910 Naval Programme.
28 <i>Iron Duke</i> ..	26,400(e)	39,000(e)	22.5	10 13.5-in. B.	12 6-in. Q.	Jan. 15, 1912	Oct. 12, 1912	1911 Naval Programme.
29 <i>Marlborough</i> ..	26,400(e)	39,000(e)	22.5	10 13.5-in. B.	12 6-in. Q.	Jan. 25, 1912	Oct. 24, 1912	
30 <i>Delhi</i> ..	26,400(e)	39,000(e)	22.5	10 13.5-in. B.	12 6-in. Q.	May 31, 1912	Sept., 1913	
31 <i>Bombay</i> ..	26,400(e)	39,000(e)	22.5	10 13.5-in. B.	12 6-in. Q.	May 30, 1912	Oct., 1913	
32 <i>Tiger</i> * ..	28,000(e)	110,000(e)	30	8 13.5-in. B.	16 6-in. Q.	June 20, 1912	Nov., 1913	1912 Naval Programme.
33 <i>Queen Elizabeth</i> ..	27,500(e)	58,000(e)	25	8 15-in. B.	16 6-in. Q.	Oct. 21, 1912	Oct., 1913	
34 <i>Warrior</i> ..	27,500(e)	58,000(e)	25	8 15-in. B.	16 6-in. Q.	Oct. 31, 1912	Nov., 1913	

NOTE.—An asterisk after a vessel's name denotes a battle-cruiser as distinct from a battleship.

Of these ships, the *Audacious* has completed her trials and will be ready in September, and finally, a list of ships on the stocks or to be laid down.

GERMANY.—Fifteen ships, as enumerated in the table on p. 70 are complete, or should be so about the date this book is published.

A word as to these vessels. The first four are, to be blunt, failures. They are mediocre in design, have too many guns for their displacement, and these so badly placed that their battle-value is comparable rather to our *Lord Nelson* class than to our earliest Dreadnought. Against our later vessels they would have no chance; the "close action in a fog" theorists will disagree with me here, because of the German secondary battery. The only satisfactory craft amongst them are the four battle-cruisers *Von der Tann*, *Moltke*, *Goeben*, and *Seydlitz*. The second of these is a contemporary of our *Lion*, which carries eight 13·5-in. guns, and the Ostfrieslands are contemporaries of our *Orion* class, which mounts ten of these weapons. There is no need for me to make further comparisons; the tables are ample in their demonstration.

Of the eleven ships given in the table on p. 71, six have been or are about to be launched, and the remainder are building or to be laid down shortly.

The *König Albert* and *Prinzregent Luitpold* are due for delivery late in 1913, the *König* in the

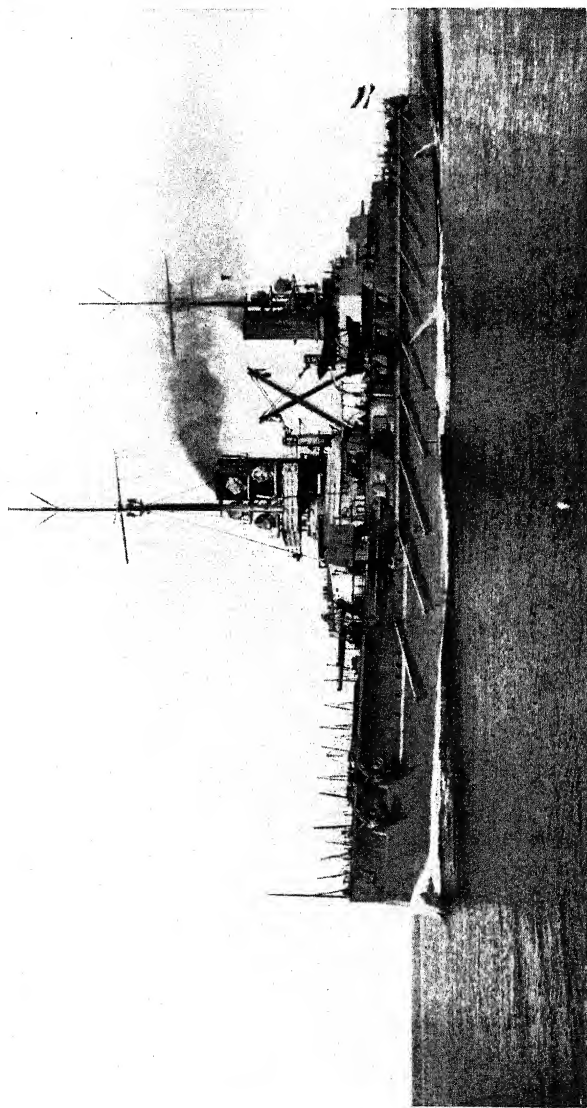
BRITISH BATTLESHIPS AND BATTLE-CRUISERS ON THE STOCKS, OR TO BE LAID DOWN

	Name	Displacement in Tons	Designed I.H.P.	Speed in Knots	Armament		When Laid Down	To be Completed	
					Main	Secondary			
35	<i>Valkent</i> ..	27,500(e)	58,000(e)	25	8 15-in. B.	16 6-in. Q.	Jan. 31, 1913	Jan., 1915	} 1912 Naval Programme F. Malay S. ship
36	<i>Barham</i> ..	27,500(e)	58,000(e)	25	8 15-in. B.	16 6-in. Q.	Feb. 24, 1913	Jan., 1915	
37	<i>Malaya</i> ..	27,500(e)	58,000(e)	25	8 15-in. B.	16 6-in. Q.	July, 1913	July, 1915	
38	1 ..	—	—	—	—	—	Oct., 1913	Oct., 1915	} 1913 Naval Programme
39	2 ..	—	—	—	—	—	Nov., 1913	Oct., 1915	
40	3 ..	—	—	—	—	—	— 1913	Oct., 1915	
41	4 ..	—	—	—	—	—	— 1913	Oct., 1915	
42	5 ..	—	—	—	—	—	— 1913	Oct., 1915	

GERMAN DREADNOUGHTS AND BATTLE-CRUISERS COMPLETED

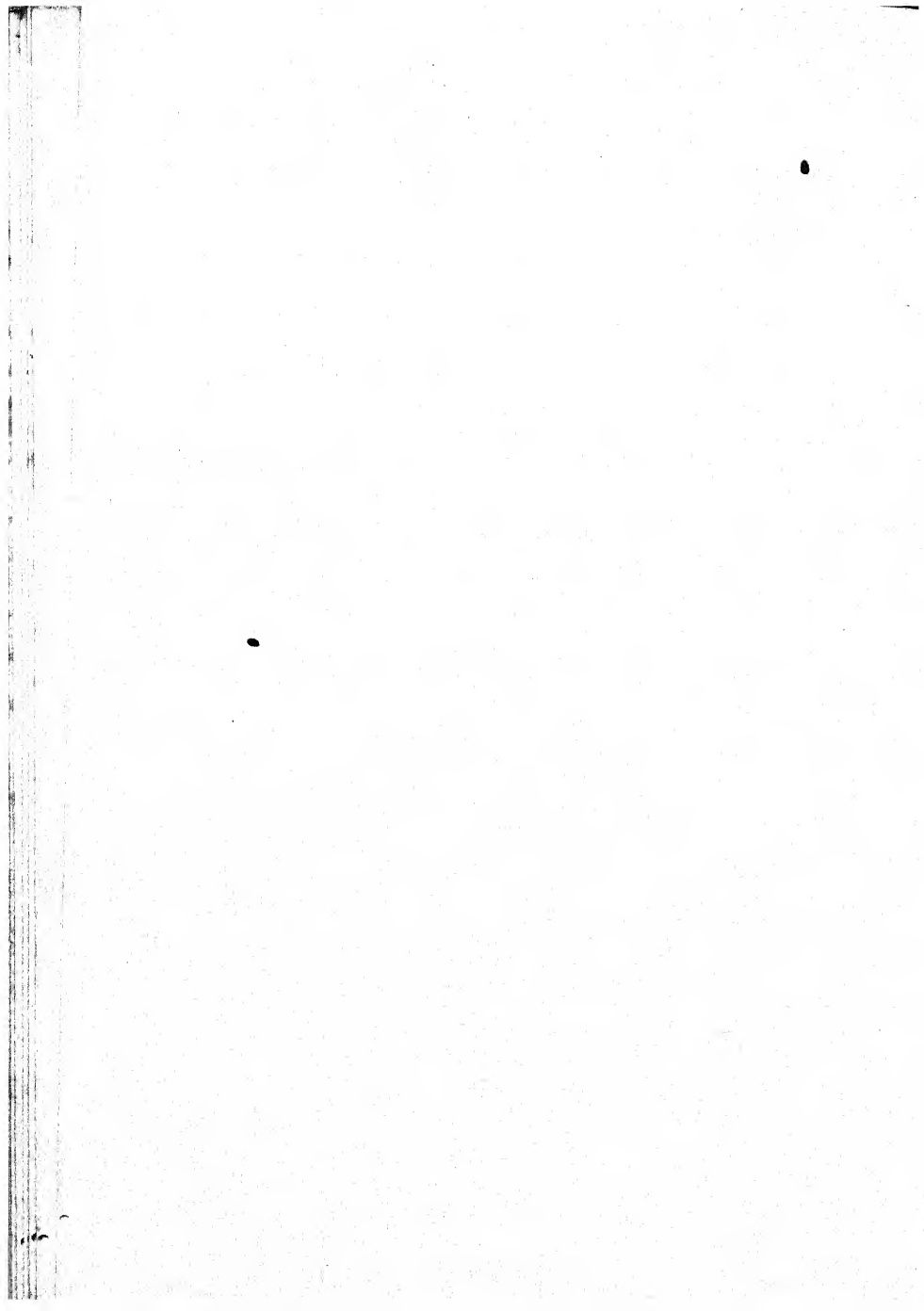
	Name	Displacement in Tons	Designed I.H.P.	Speed in Knots	Armament		When Laid Down	When Launched	Completion of Trials
					Main	Secondary			
1	<i>Nassau</i>	18,600	20,000(r)	20.7	12 11-in. B.	12 5.9-in. Q.	July 22, 1907	Mar. 7, 1908	May 3, 1910
2	<i>Westfalen</i>	18,600	20,000(r)	20.4	12 11-in. B.	12 5.9-in. Q.	Aug., 1907	July 1, 1908	May 3, 1910
3	<i>Rheinland</i>	18,600	20,000(r)	20.1	12 11-in. B.	12 5.9-in. Q.	Aug., 1907	Sept. 26, 1908	Sept. 2, 1910
4	<i>Posen</i>	18,600	20,000(r)	20.5	12 11-in. B.	12 5.9-in. Q.	Aug., 1907	Dec. 12, 1908	Sept. 2, 1910
5	<i>Von der Tann*</i>	19,100	43,000	23.12	8 11-in. B.	10 5.9-in. Q.	Mar. 25, 1908	Mar. 20, 1909	Feb. 20, 1911
6	<i>Ostfriesland..</i>	22,440	25,000(r)	21.23	12 12-in. B.	14 5.9-in. Q.	Oct. 10, 1908	Sept. 30, 1909	Sept. 15, 1911
7	<i>Helgoland..</i>	22,440	25,000(r)	20.81	12 12-in. B.	14 5.9-in. Q.	Dec. 24, 1908	Sept. 25, 1909	Dec. 19, 1911
8	<i>Thuringen..</i>	22,440	25,000(r)	21.07	12 12-in. B.	14 5.9-in. Q.	Nov. 2, 1908	Nov. 27, 1909	Sept. 10, 1911
9	<i>Moltke*</i>	22,640	52,000	23.57	10 11-in. B.	12 5.9-in. Q.	April, 1909	April 7, 1910	Mar. 31, 1912
10	<i>Goeben*</i>	22,640	52,000	23.6	10 11-in. B.	12 5.9-in. Q.	Aug., 1909	Mar. 28, 1911	Aug. 28, 1912
11	<i>Oldenburg..</i>	22,440	25,000(r)	21.41	12 12-in. B.	14 5.9-in. Q.	Mar. 1, 1909	June 30, 1910	July 1, 1912
12	<i>F. der Gross</i>	24,310	28,000	23.8	10 12-in. B.	14 5.9-in. Q.	Jan. 26, 1910	June 10, 1911	Jan. 22, 1913
13	<i>Kaiser..</i>	24,310	28,000	23.6	10 12-in. B.	14 5.9-in. Q.	Oct., 1909	Mar. 22, 1911	Dec. 7, 1912
14	<i>Seydlitz*</i>	24,310	63,000	23.	10 11-in. B.	12 5.9-in. Q.	Feb. 4, 1911	Mar. 30, 1912	Aug., 1913
15	<i>Katrin..</i>	24,310	28,000	21.	10 12-in. B.	14 5.9-in. Q.	Nov., 1910	Nov. 11, 1911	Aug., 1913

NOTE.—An asterisk after a vessel's name denotes a battle-cruiser as distinct from a battleship.



Photograph by Krupp

GERMAN BATTLESHIP "PRINZREGENT LUITPOLD"



THE "DREADNOUGHT" TYPE

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GERMAN DREADNOUGHTS AND BATTLE-CRUISERS LAUNCHED AND BUILDING

Name	Displacement in Tons	Designed I.H.P.	Speed in Knots	Armament		When Laid Down	When Launched	
				Main	Secondary			
16 <i>König Albert</i> ..	24,310	28,000	21	10 12-in. B.	14 5.9-in. Q.	July, 1910	April 27, 1912	} 1910 Naval Programme
17 <i>P. Revent Luipold</i> ..	24,310	28,000	21	10 12-in. B.	14 5.9-in. Q.	Nov., 1910	Feb. 17, 1912	
18 <i>Markgraf</i> ..	26,575(e)	35,000	22	10 12-in. B.	14 5.9-in. Q.	Nov., 1911	June 4, 1913	} 1911 Naval Programme
19 <i>Grosser Kurfürst</i> ..	26,575(e)	35,000	22	10 12-in. B.	14 5.9-in. Q.	Nov., 1911	May 5, 1913	
20 <i>König</i> ..	26,575(e)	35,000	22	10 12-in. B.	14 5.9-in. Q.	May, 1911	Mar. 1, 1913	
21 <i>Defflinger</i> ..	28,000(e)	100,000	28	8 12-in. B.	12 5.9-in. Q.	Mar., 1912	July 1, 1913	} 1912 Naval Programme
22 <i>E. Brandenburg</i> ..	26,575(e)	35,000	22	10 12-in. B.	14 5.9-in. Q.	May, 1912	1913	
23 <i>E. Kaiserin Augusta</i> *	—	—	—	8 12-in. B.	12 5.9-in. Q.	Sept., 1912	1914	} 1913 Naval Programme
24 <i>E. Worth</i> ..	—	—	—	8 15-in. B.	16 5.9-in. Q.	1913	1914	
25 <i>"T"</i> ..	—	—	—	8 15-in. B.	16 5.9-in. Q.	1913	1914	
26 <i>E. Hertha</i> *	—	—	—	8 15-in. B.	12 5.9-in. Q.	1913	1914	

NOTE.—An asterisk after a vessel's name denotes a battle-cruiser as distinct from a battleship.

WHAT OF THE NAVY?

spring of 1914, the *Markgraf* and *Grosser Kurfürst* in the early summer of 1914, the battle-cruiser *Derf-*

	Lord Nelson	Dreadnought	Deutschland	Westfalen
Displacement . .	16,500 tons	17,900 tons	12,997 tons	18,600 tons
Designed I.H.P. .	16,750	23,000	16,000	20,000
Designed Speed .	18.5 knots	21 knots	18 knots	19.5 knots
Trial I.H.P., mean .	17,445	24,712	16,940	27,477
Trial Speed, mean .	18.9 knots	21.25 knots	18.8 knots	20.4 knots
Armament . .	4 12-in. B. 10 9.2-in. B. 24 3-in. Q. 5 smaller	10 12-in. B. — 24 3-in. Q. 5 smaller	4 11-in. B. 14 6.7-in. Q. 22 3.4-in. Q. 8 smaller	12 11-in. B. 12 5.9-in. Q. 16 3.4-in. Q. 4 smaller
Torpedo Tubes . .	5	5	6	6
Coal Capacity, normal	900 tons	900 tons	700 tons	950 tons
Coal Capacity, maxim.	2,500 tons	2,700 tons	1,800 tons	2,700 tons
Broadside Fire . .	5,300 lb.	6,800 lb.	4,029 lb.	6,466 lb.
End-on Fire . .	3,220 lb.	5,100 lb.	2,367 lb.	4,924 lb.
Total Fire . .	7,200 lb.	8,500 lb.	4,222 lb.	10,251 lb.

flinger in the autumn, 1914, the battle-cruiser *Ersatz Kaiserin-Augusta* in the spring and the *Ersatz Brandenburg* in the summer of 1915, whilst the last three will not commission until the summer of 1916.

	Differences between	
	(1) Lord Nelson and Dreadnought	(2) Deutschland and Westfalen
Displacement . .	+ 1,400 tons	+ 5,603 tons
Designed I.H.P. .	+ 6,250	+ 4,000
Designed Speed .	+ 2.5 knots	+ 1.5 knots
Trial I.H.P., mean .	+ 7,267	+ 11,537
Trial Speed, mean .	+ 2.35 knots	+ 1.6 knots
Coal Capacity, normal .	Nil	+ 250 tons
" " maximum	+ 200 tons	+ 900 "
Broadside Fire . .	+ 1,500 lbs.	+ 3,411 lbs.
End-on Fire . .	+ 1,880 "	+ 3,236 "
Total Fire . .	+ 1,300 "	+ 6,029 "

Why are German designs, as exemplified by the vessels so far completed, of so mediocre a type? Perhaps the short parallel in the table at the top

of page 72 will be the easiest method of answering this question.

Here we have side by side the first British and German Dreadnoughts compared with their immediate predecessors. From this is taken the table of differences given on p. 72.

There was once a tricycle rider who, seeing a man pedalling a bicycle with the obvious facility of past experience, boasted that he could do equally well as the result of mere observation—in the result he damaged himself and his machine. Germany is that man to-day—we came to the *Dreadnought* by gradual steps, whilst in Germany they expected equal success though ignoring the course of gentle evolution. The *Dreadnought* may not be all that could be wished; but the first four Teuton units leave everything to be desired. The unsuccessful endeavours of their Government to foist these nautical misconceptions first upon Turkey (being shop-soiled—at a reduced price), and next upon a South American Republic which now is engaged in Dreadnought construction under the wiser conditions of British experience, give point to these remarks.

Last year—to be precise, on June 14th, 1912—the German peoples were once more made the victims of a further Naval Law. The *matériel* provisions under this latest *Novelle* provide for three additional armoured ships; one to be commenced in 1913, one in 1916, and the third at a period as yet unspecified.

WHAT OF THE NAVY?

In July following this spendthrift resolve, Mr. Churchill, First Lord of the Admiralty, announced our *riposte*, and the two prospective efforts are given below, side by side.

	Germany [Novelle, June 14th, 1912]	Great Britain
1912 . . .	2	4
1913 . . .	3	5
1914 . . .	2	4
1915 . . .	2	4
1916 . . .	3	4
1917 . . .	2	4
Totals . .	14	25

THE UNITED STATES OF AMERICA.—Though America is not laying down large programmes, her designers have the satisfaction of knowing that the disposition of the guns along the centre-line of their ships is being accepted as the most practical and serviceable by nearly all the Great Powers.

Of the remaining five building, two have already been launched. All have met with delays. The little "r" after the engine power in the following tables denotes reciprocating engines. The others are turbines.

The latest official dates for the delivery of the *Texas* and *New York* are December 17th, 1913, and May 1st, 1914. For the *Nevada* and *Oklahoma* the date of delivery is January 22nd, 1915, and the spring of 1916 should see the *Pennsylvania* in commission, her contract having been signed with the Newport News Shipbuilding Company on February 27th, 1913.

THE "DREADNOUGHT" TYPE

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U.S.A. DREADNOUGHTS IN COMMISSION

	Name	Displacement in Tons	Designed I.H.P.	Trial Speed in Knots	Armament		When Laid Down	When Launched	When Commissioned for Service
					Main	Secondary			
1	<i>Michigan</i>	16,000	16,500(r)	20-01	8 12-in. B.	22 3-in. Q.	Dec. 17, 1906	May 26, 1908	Jan. 4, 1910
2	<i>South Carolina</i>	16,000	16,500(r)	20-52	8 12-in. B.	22 3-in. Q.	Dec. 18, 1906	July 11, 1908	Mar. 1, 1910
3	<i>North Dakota</i>	25,000	20,000	22-25	10 12-in. B.	14 5-in. Q.	Dec. 16, 1907	Nov. 10, 1908	April 11, 1910
4	<i>Delaware</i>	25,000	20,000(r)	21-98	10 12-in. B.	14 5-in. Q.	Nov. 11, 1907	Feb. 6, 1909	April 4, 1910
5	<i>Florida</i>	21,825	21,000	22-54	10 12-in. B.	16 5-in. Q.	Mar. 9, 1909	May 12, 1910	Sept. 15, 1911
6	<i>Utah</i>	21,825	21,000	21-92	10 12-in. B.	16 5-in. Q.	Mar. 15, 1909	Dec. 23, 1909	Aug. 31, 1911
7	<i>Wyoming</i>	26,000	28,000	22-04	12 12-in. B.	21 5-in. Q.	Feb. 9, 1910	May 25, 1911	Sept. 25, 1912
8	<i>Arkansas</i>	26,000	28,000	21-49	12 12-in. B.	21 5-in. Q.	Jan. 25, 1910	Jan. 14, 1911	Sept. 17, 1912

U.S.A. DREADNOUGHTS LAUNCHED AND BUILDING

	Name	Displacement in Tons	Designed I.H.P.	Designed Speed in Knots	Armament		When Laid Down	When Launched	
					Main	Secondary			
9	<i>Texas</i>	27,000	28,100(r)	21	10 14-in. B.	21 5-in. Q.	April 17, 1911	May 18, 1912	{ Authorised June, 1910
10	<i>New York</i>	27,000	28,100(r)	21	10 14-in. B.	21 5-in. Q.	Sept. 11, 1911	Oct. 30, 1912	{ Authorised
11	<i>Nevada</i>	27,500	26,500	20-5	10 14-in. B.	21 5-in. Q.	Nov. 4, 1912	—	{ Authorised Mar. 1911
12	<i>Oklahoma</i>	27,500	26,500(r)	20-5	10 14-in. B.	21 5-in. Q.	Oct. 26, 1912	—	{ Authorised
13	<i>Pennsylvania</i> (1)	31,400	31,500	21	12 14-in. B.	22 5-in. Q.	July, 1913	—	{ Authorised Aug., 1912

(1) A second of this type has been authorised.

JAPANESE DREADNOUGHTS AND BATTLE-CRUISERS IN COMMISSION AND
BUILDING

	Name	Displacement in Tons	Designed T.M.P.	Speed in Knots	Armament		When Laid Down	When Launched	When Commissioned for Service
					Main	Secondary			
1	<i>Satsuma</i>	19,250	18,000(t)	20	{ 4 12-in. B. }	8 6-in. Q.	May 15, 1905	Nov. 15, 1906	April 1, 1910
2	<i>Aki</i>	19,780	24,000	20.23	{ 12 10-in. B. }	8 6-in. Q.	Mar. 15, 1905	April 15, 1907	April 1, 1911
3	<i>Kawachi</i>	20,800	26,500	21.5	12 12-in. B.	10 6-in. Q.	Jan. 18, 1909	Oct. 15, 1910	Aug., 1912
4	<i>Settsu</i>	20,800	26,500	20.5	12 12-in. B.	10 6-in. Q.	April 1, 1909	Mar. 30, 1911	Oct., 1912
5	<i>Kongo</i>	27,500	64,000	27	8 14-in. B.	16 6-in. Q.	Jan. 17, 1911	May 18, 1912	Sept., 1913
6	<i>Hiei</i>	27,500	64,000	27	8 14-in. B.	16 6-in. Q.	Nov. 4, 1911	Nov. 19, 1912	Autumn, 1915
7	<i>Haruna</i>	27,500	64,000	27	8 14-in. B.	16 6-in. Q.	Mar. 16, 1912	? 1913	Spring, 1916
8	<i>Kirishima</i>	27,500	64,000	27	8 14-in. B.	16 6-in. Q.	Mar. 17, 1912	? 1913	Spring, 1916
9	<i>Fuso</i>	31,000	45,000	22.5	12 14-in. B.	16 6-in. Q.	Mar. 11, 1912	? 1913	Spring, 1917
10	2	31,000	45,000	22.5	12 14-in. B.	16 6-in. Q.	July, 1913	? 1917	1917
11	3	31,000	45,000	22.5	12 14-in. B.	16 6-in. Q.	July, 1913	? 1917	1917
12	4	31,000	45,000	22.5	12 14-in. B.	16 6-in. Q.	July, 1913	? 1917	1917

The *Nevada* and *Oklahoma* will be the first American battleships to mount three big guns in one turret.

JAPAN.—Our Eastern Ally has four battleships, two of them improvements on our *Lord Nelson* class, in commission; the other two are real single-calibre units. Four huge battleships and four battle-cruisers are on the stocks or completing afloat; one of the latter, the *Kongo*, has concluded her trials, and is practically ready for service.

FRANCE.—This country has commissioned six modified Lord Nelsons and two fine single-calibre units, and a number more are in various stages of construction.

In April, 1913, M. Baudin, during the debate on the Navy Estimates, stated that the shipbuilding programme adopted in March, 1912, was not to be regarded as final. New Bills, now under discussion, provide for the construction of three additional battleships and the acceleration of the existing programme. The first of the supplementary ships it is proposed to start on October 1st, 1913, and further, according to a carefully drawn up building timetable, two will be laid down in October, 1914, two in April, 1915, two in April and two in October, 1916. The three supplementary battleships are to cost £10,200,000 or £3,400,000 apiece—a very vast sum.

Of the vessels given in the tabulation the quartette commencing with the *Normandie* are unique in this,

WHAT OF THE NAVY?

FRENCH DREADNAUGHTS IN COMMISSION AND BUILDING

	Name	Displacement-Tons	Designed L.H.P.	Trial Speed in Knots	Armament		When Laid Down	When Launched	When Completed	
					Main	Secondary				
1	<i>Voltaire</i>	18,027	22,500	20.66	4 12-in. B. 12 9.4-in. B.	16.3 in. Q.	July 20, 1907	Jan. 16, 1909	Aug. 1, 1911	1906 Naval Programme
2	<i>Diderot</i>	18,027	22,500	20.14			Oct. 20, 1907	April 18, 1909	Aug. 1, 1911	
3	<i>Condorcet</i>	18,027	22,500	19.79			Aug. 23, 1907	April 21, 1909	July 23, 1911	
4	<i>Danton</i>	18,027	22,500	20.18			Jan. 9, 1908	July 4, 1909	June 1, 1911	
5	<i>Mirabeau</i>	18,027	22,500	19.73	12 12-in. B. 12 12-in. B. 10 13.4-in. B. 12 13.4-in. B.	22 5.5-in. Q. 22 5.5-in. Q. 22 5.5-in. Q. 22 5.5-in. Q.	May 4, 1908	Oct. 23, 1909	Aug., 1911	1910 Programme
6	<i>Vernaud</i>	18,027	22,500	19.65			Nov. 15, 1907	April 12, 1910	Jan. 20, 1912	
7	<i>Courbet</i>	23,095	28,000	20.63			Sept. 1, 1910	Sept. 23, 1911	June 5, 1913	
8	<i>Jean Bart</i>	23,095	28,000	23.07			Nov. 10, 1910	Sept. 22, 1911	Aug., 1913	
9	<i>France</i>	23,095	28,000	20	12 12-in. B.	22 5.5-in. Q.	Nov. 1, 1911	Nov. 7, 1912	Aug., 1914	1911 Programme
10	<i>Paris</i>	23,095	28,000	20	12 12-in. B.	22 5.5-in. Q.	Nov. 30, 1911	Sept. 23, 1912	Aug., 1914	
11	<i>Lorraine</i>	23,177	29,000	20	10 13.4-in. B.	22 5.5-in. Q.	Nov. 7, 1912	1913	1915	1912 Programme
12	<i>Bretagne</i>	23,177	29,000	20	10 13.4-in. B.	22 5.5-in. Q.	July 22, 1912	April 21, 1913	June, 1915	
13	<i>Provence</i>	23,177	29,000	20	10 13.4-in. B.	22 5.5-in. Q.	May 1, 1912	April 20, 1913	Aug., 1915	1913 and 1914 Programmes
14	<i>Normandie</i>	24,880	33,000	21	12 13.4-in. B.	24 5.5-in. Q.	May 1, 1913	1914	May, 1916	
15	<i>Lequedoc</i>	24,880	33,000	21	12 13.4-in. B.	24 5.5-in. Q.	April 28, 1913	1914	Summer, 1916	
16	<i>Gasconne</i>	24,880	33,000	21	12 13.4-in. B.	24 5.5-in. Q.	Oct., 1913	1915	Summer, 1916	
17	<i>Flandre</i>	—	—	—	—	—	Oct., 1913	1915	Oct., 1916	
18	—	—	—	—	—	—	Oct., 1913	1915	Oct., 1916	

THE "DREADNOUGHT" TYPE

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that their armament is disposed in three quadruple turrets on the centre-line.

RUSSIA.—This nation has four Dreadnoughts

RUSSIAN DREADNOUGHTS AND BATTLE-CRUISERS BUILDING

	Name	Displacement in Tons	Designed L.H.P.	Speed in Knots	Armament		When Laid Down
					Main	Secondary	
1	<i>Sevastopol</i>	23,000	42,000	23	12 12-in. B.	16 4.7-in. Q.	June 16, 1909
2	<i>Petropavlovsk</i>	23,000	42,000	23	12 12-in. B.	16 4.7-in. Q.	June 16, 1909
3	<i>Polava</i>	23,000	42,000	23	12 12-in. B.	16 4.7-in. Q.	June 16, 1909
4	<i>Gangut</i>	23,000	42,000	23	12 12-in. B.	16 4.7-in. Q.	June 16, 1909
5	<i>Imp. Alexander III.</i>	22,700	25,000	21	12 12-in. B.	12 5-in. Q.	July 7, 1911
6	<i>Imp. Marie</i>	22,700	25,000	21	12 12-in. B.	12 5-in. Q.	July 7, 1911
7	<i>Catherine II.</i>	23,000	25,000	21	12 12-in. B.	12 5-in. Q.	Sept. 1, 1912
8	<i>Borodino*</i>	32,200	66,000	26.5	9 14-in. B.	20 4.7-in. Q.	Dec. 19, 1912
9	<i>Navarin*</i>	32,200	66,000	26.5	9 14-in. B.	20 4.7-in. Q.	Dec. 19, 1912
10	<i>Kinburn*</i>	32,200	66,000	26.5	9 14-in. B.	20 4.7-in. Q.	Dec. 19, 1912
11	<i>Imail*</i>	32,200	66,000	26.5	9 14-in. B.	20 4.7-in. Q.	Dec. 19, 1912

NOTE.—An asterisk after a vessel's name denotes a battle-cruiser as distinct from a battleship.

nearing completion afloat, three on the stocks in the Black Sea, and four battle-cruisers building in the Baltic.

All eleven ships have their guns disposed in triple

WHAT OF THE NAVY?

turrets along the centre line. The first four were launched on June 29th, September 9th, July 10th,

ITALIAN DREADNOUGHTS LAUNCHED AND BUILDING

	Name	Displacement in Tons	Designed I.H.P.	Speed in Knots	Armament		When Laid Down	When Launched
					Main	Secondary		
1	<i>Dante Alighieri</i>	19,400	23,000	24.2	12 12-in. B.	20 4.7-in. Q.	June 6, 1909	Aug. 20, 1910
2	<i>Conte di Cavour</i>	22,340	24,000	21	13 12-in. B.	18 4.7-in. Q.	Aug. 10, 1910	Aug. 10, 1911
3	<i>Leonardo da Vinci</i>	22,340	24,000	21	13 12-in. B.	18 4.7-in. Q.	July 18, 1910	Oct. 14, 1911
4	<i>Giulio Cesare</i>	22,340	24,000	21	13 12-in. B.	18 4.7-in. Q.	June 23, 1910	Oct. 15, 1911
5	<i>Cato Dutillo</i>	22,340	24,000	21	13 12-in. B.	16 6-in. Q.	April 25, 1912	April 24, 1913
6	<i>Andrea Doria</i>	23,340	24,000	21	13 12-in. B.	16 6-in. Q.	Mar. 24, 1912	Mar. 30, 1913
7	<i>Marconi</i>	29,510	48,000	25	8 15-in. B.	20 6-in. Q.	1913	1916
8	<i>Dandolo</i>	29,510	48,000	25	8 15-in. B.	20 6-in. Q.	1913	1916
9	<i>G. Mazzini</i>	29,510	48,000	25	8 15-in. B.	20 6-in. Q.	1913	1917
10	<i>G. Mameli</i>	29,510	48,000	25	8 15-in. B.	20 6-in. Q.	1913	1917

and October 7th, 1911, respectively, and are to be completed during the spring of 1914. The other

THE "DREADNOUGHT" TYPE 81

seven are to commission in the course of 1916 and 1917.

ITALY.—The *Dante Alighieri* was finally commissioned after completion of exhaustive trials on January 26th, 1913. Two of the three *Leonardo* class are practically ready, and all three are expected to join the fleet in the spring of 1914, the *Duilio* and *Doria* being finished a year later. The two *Morosinis* are due in the autumn of 1915, and the pair now proposed and still under discussion will be coming forward for service during 1916. Thus Italy has three complete, three completing afloat, and four either on the stocks or projected for the immediate future.

AUSTRO-HUNGARIAN DREADNOUGHTS IN COMMISSION AND BUILDING

	Name	Displacement in Tons	Designed I.H.P.	Speed in Knots	Armament		When Laid Down
					Main	Secondary	
1	<i>Viribus Unitis</i>	20,000	25,000	21.2	12 12-in. B.	12 5.9-in. Q.	July 23, 1910
2	<i>Tegetthof</i> ..	20,000	25,000	20.7	12 12-in. B.	12 5.9-in. Q.	Sept. 24, 1910
3	<i>Prinz Eugen</i> ..	20,000	25,000	20.5	12 12-in. B.	12 5.9-in. Q.	Jan. 16, 1912
4	<i>Szent Istvan</i> ..	20,000	25,000	20.5	12 12-in. B.	12 5.9-in. Q.	Jan. 29, 1912

AUSTRIA.—The Dual Monarchy has one ship in commission, the second completing her trials, and the last two completing afloat.

The *Viribus Unitis* after attaining a mean speed of 20.87 knots (maximum, 21.2 knots) on trial, was commissioned on October 6th, 1912, for just twenty-

six and a half months after her keel was laid ; she was launched on June 4th, 1911. The *Tegetthof* was launched on March 21st, 1912, and the *Prinz Eugen* on November 30th of the same year. The fourth, if nothing untoward occurs, should be afloat by the time this appears in print. The last two are to be ready in June, 1914, and the spring of 1915 respectively. Three other vessels to replace the aged *Monarch* class (of 5,462 tons) have been authorised, but no money voted. One may be laid down this year if funds are forthcoming.

It is no easy matter to set a proper estimate on the rising naval power of the Dual Monarchy. There are many people in this country who see in this determination to establish a position of prominence upon the seas, a subtle move of our Northern neighbour Germany—the basis of the deep-laid scheme being, it is suggested, the forced division of our battle-fleet, in the event of war, between the Mediterranean and North Sea. Though the creation of a British Dreadnought squadron up the Straits must eventually prove necessary, it certainly will not be for the reason hinted at. The situation is the better understood when it is recognised that, paradoxical as it may seem, the Triple Alliance is more potent as a menace to us with Austria and Italy mutually antagonistic in national feeling, than it would be were these two nations closely bound by all the ties of friendship. Their naval exertions are directed

against each other—without this incentive to maritime expansion, which they cannot afford, neither threats nor blandishments from the senior partner in the Triple Alliance would induce the expenditure of moneys so badly needed for internal social development. Naval critics admire the method and economy of Austrian naval administration. It is remarkable how much value they can obtain for the relatively small amount of money spent, and careful observers can trace in the steady plodding administration a resemblance to German naval progress, that not inconceivably may place Austria foremost amongst the Mediterranean Sea Powers.

Yet Italy is not slow in these days—her first six Dreadnoughts have averaged under fifteen months from the date of commencement to the day of launch. Their existing fleets are not negligible nor are their personnels ill-found or badly trained. If these two forces were combined they would constitute a fleet of imposing dimensions, and it is the realisation of this dream that inspires the Pan-German with enthusiasm. It remains to be seen, however, whether community of interests will ever be strong enough to induce Austria-Hungary and Italy, as partners in the Triplice, to battle against a common foe. At present, such a union would be strongly reminiscent of the lion and the lamb. While the wide gulf, political and sentimental, that divides the two nations to-day is being assiduously broadened by influential

DREADNOUGHTS OF OTHER COUNTRIES COMMISSIONED AND BUILDING

	Name	Displacement in Tons	Designed I.H.P.	Speed in Knots	Armament		When Laid Down	When Launched	When Commissioned for Service
					Main	Secondary			
1	SPAIN								
	<i>España</i>	15,460	15,300	19.5	8 21-in. B.	20 4-in. Q.	Dec. 5, 1909	Feb. 5, 1912	1913
2	<i>Alfonso XIII.</i>	15,460	15,300	19.5	8 12-in. B.	20 4-in. Q.	Feb. 23, 1910	May 8, 1913	1914
3	<i>Juana I.</i>	15,460	15,300	19.5	8 12-in. B.	20 4-in. Q.	Feb. 5, 1912	May 8, 1914	1915
1	TURKEY								
	<i>Reshad V.</i>	23,000	31,000	21.5	10 13.5-in. B.	16 6-in. Q.	Dec. 6, 1911	1913	1914
1	GREECE								
	<i>Salamine</i>	19,500	40,000	23	8 14-in. B.	12 6-in. Q.	Mar., 1913	1914	1915
1	BRAZIL								
	<i>Minas Geras</i>	19,250	24,000(r)	21.43	12 12-in. B.	22 4.7-in. Q.	Summer, 1907	Sept. 10, 1908	Jan. 5, 1910
2	<i>Sao Paulo</i>	19,250	24,000(r)	21.42	12 12-in. B.	22 4.7-in. Q.	Summer, 1907	April 20, 1909	1910
3	<i>Rio-de-Janeiro</i>	27,500	45,000	22	14 12-in. B.	20 6-in. Q.	Sept. 14, 1911	Jan. 22, 1913	1914
1	CHILI								
	<i>A. La Torre</i>	28,000	37,000	22	10 14-in. Q.	16 6-in. Q.	Dec. 15, 1911	Oct., 1913	1914
2	<i>A. Cochran</i>	28,000	37,000	22	10 14-in. B.	16 6-in. Q.	Jan. 23, 1913	1914	1915
1	ARGENTINE								
	<i>Rivadavia</i>	27,940	39,500	23.5	12 12-in. B.	12 6-in. Q.	May 25, 1910	Aug. 26, 1911	1913
2	<i>Moreno</i>	27,940	39,500	23.5	12 12-in. B.	12 6-in. Q.	July 9, 1910	Sept. 23, 1911	1913

THE "DREADNOUGHT" TYPE 85

people in both lands, hardly a voice is heard in advocacy of a *rapprochement*. Neither side will tolerate for an instant the conception of a golden bridge across the Adriatic.

No sound strategy, it may be argued, in answer to the preceding remarks, can be grounded on transient racial or political considerations, and no tension now existing between two of its partners can alter the fact that the Triple Alliance is in a position seriously to disturb the *status quo* in the Mediterranean.

	Number of Dreadnought Era Units complete by March 31st, in			
	1913	1914	1915	1916
British Empire. . . .	23	30	36	42
Germany	12	17	21	26
United States	8	9	12	13
France	6	8	10	13
Japan	4	5	5	9
Italy	1	4	6	8
Russia	Nil	4	4	7
Austria	1	2	4	4
Brazil	2	2	3	3
Spain	Nil	1	2	3
Argentina. . . .	Nil	2	2	2
Chili	Nil	Nil	1	2
Turkey	Nil	Nil	1	1
Greece	Nil	Nil	1	1

Space does not permit of a detailed description of the remaining vessels—their official anticipated dates (mostly untrustworthy) of launch and completion are given in the table on p. 84. It may,

perhaps, be well to chronicle that in all probability the unit for Turkey will find its way into our fleet at no distant date.

Let us now summarise the above, as in the table on p. 85, and the Dreadnought mystery becomes clear as daylight.

This, then, is the story of the Dreadnought. I am certain my figures will in many cases be proved wrong ; they are (as has so often been found in the past) too optimistic in regard to foreign progress, which tends more and more towards delay ! Yet it were better, where the national well-being is in question, to take no risks, but to be on the right side. Our future policy is not difficult to state.

What we require from now onwards is not only a sufficient number of units, but that they should, in part at least, be placed on the stocks at the commencement of the financial year for which they are voted. Nor is it wise to whittle down the margin of superiority to too fine a point ; our position should be such that none can take a period of months in the future and say, " That will be the time of greatest danger." We are safe to-day, safe next year, and safe the year after ; but has sufficient allowance been made for possible delays owing to strikes or other causes, possible (though improbable) acceleration in foreign programmes, loss of ships by accident, or the purchase of first-class units from such nations as Brazil, Argentine, Chili, Turkey, etc., by Continental rivals ?

I doubt it. I do not ask for a single vessel more than is absolutely necessary—delay in commencement brings improvement in design and general efficiency ; but, having said so much, I must emphasise this, *that it is far better, when the day of Armageddon is on us, to have one hundred too many than one too few.* All these matters, stripped of the natural exaggerations of partisanship, resolve themselves into this : Are we to trust the talented and experienced naval officers who, with their civil colleagues, form the Board of Admiralty ? If the answer is in the negative, then all hope for the future of our Empire is shattered ; if in the affirmative, we may be permitted to believe (since they have not resigned) that in their measured judgment and expert opinion ample provision has been made for the maintenance of our naval supremacy.

Yet a change is coming—and here I hark back to my opening remarks. Ships, prior to the *Dreadnought's* appearance, displaced 12,000 to 16,500 tons—now they are being built well over 30,000 tons ; then they cost £1,000,000 to £1,300,000—now they run from £2,250,000 to as high as £3,800,000 apiece ! It is the old cycle running its course, the old battle of guns *v.* armour. To-day we concentrate in the *King George V.* a broadside the discharge of which many say no human system can withstand ; yet we must go on, for the 13·5-inch gun has called forth already a 14-inch and this has invoked a 15-inch, and

so higher in calibre, and with the increase mightier ships will come. The *King George V.* is far more ahead of the *Dreadnought* than is this ship an advance on the *Lord Nelson*. Has man overrated his physical endurance—think on this: 800,000 foot-tons of energy in a single broadside!

But battleships are small compared to liners—nothing can stop their growth except the depth of naval harbours. Docks? Surely they are built to take ships, not ships to fit them. Cost? We pay less per ship in comparison to value and power obtained than ever before. Men? These will come for the bidding whilst the word “patriotism” is in the dictionary. No—there will be no limit. There may be set-backs, reactions, temporary hesitations—these will but complete the never-ending cycle; then ahead again to the 60,000-ton mastodon, flying at forty-five knots over the waves and belching steelen death from 18-in. guns or larger. This is not prophecy—it is betting on certainties.

In this race of Dreadnoughts we, at present, hold a lead—we are ahead (but not enough) in numbers, well ahead in design, leading by an amount past computation in our personnel, and supreme in the grand and noble traditions of a glorious naval past.

But a great and serious warning will shortly be spread through the whole land, aye! and one that must call for action. Nor will it be of battleships. It will be of too few air-craft and of the shortage of

our food supply in time of war that the tongues will wag—these are the real and pressing dangers, the neglected items of national policy. See to your stomachs, say I—the starving man is no fighter; glue your eyes on the heavens, thence can come Death in an awful form.

For this, at least, I give thanks devoutly; the hegemony of the wider seas is vested, as always, in ships-of-the-line, and when I note our position to-day (almost as great a ratio of superiority as against other nations as has ever existed), and review our position in the future—why, I sleep not unsoundly in my bed.

Which, for a hardened Tory, an enthusiastic Navy Leaguer, and an ardent (if imperfect) advocate of an all-powerful and ultra-efficient fleet, is a situation of some little blessedness.

CHAPTER V

ON CRUISERS AND OUR NATIONAL RESPONSIBILITIES

WHAT is there that man has fashioned which has drawn about it a larger share of romance than has the cruiser? Through all the ages it is the spry, speedy, saucy craft attendant on the ship-of-the-line that has evoked encomiums from the orator, prompted the poet, incited the scrivener, aye!—and even encouraged the playwright. The schooner, the frigate, the sloop, the barquentine, the brig, and a host of other lesser-known names to those alive to-day, were no more than the vessel we all have known as “cruiser”—a general term covering, most inappropriately, a motley crowd of craft from under 1,000 tons displacement to over 15,000 tons, steaming all speeds from 10 to over 30 knots, mounting large or small, many or few cannon according to type, design, class or nationality.

But we are approaching the end of the “cruiser,”—taking the word in its long-accepted meaning, and here I purpose to examine how this has come about. Let us first see what “cruisers” in these days of steel are supposed to do—I say supposed, for expert

thought frequently leaps ahead of public acceptance, the result being attacks upon those in command at Whitehall on the score either of incompetence or else of neglect. What is it controls the construction of *any* warship? Surely the answer is, apart from strategical and tactical considerations, the design and number of the units it may be called upon to meet; this is a practical statement and essential for acceptance as an axiom before proceeding further.

Three main divisions, then, covered the work of "cruisers":—

A. Protecting our Trade Routes.

B. Showing the Flag.

C. Acting with the Battle Fleet as circumstances necessitated.

A.—PROTECTING OUR TRADE ROUTES

The first named fully merits its position of precedence, for every minute of the day and the night throughout the year well over £500 worth of essential commodities (food alone!) arrive from overseas for consumption within the United Kingdom. It has been computed that three weeks of close blockade would see us forced to surrender through starvation; the period of time is not important—the fact that this would undoubtedly happen is surely self-evident. "Close blockade," however, has nothing to do with the cruiser question—only absolute loss of command

of the sea would permit this, and once that is lost—well! would anything matter?

The protection of commerce is something different from the usual strategical dicta applied to sea-power. We may well find ourselves in the anomalous position of having negated the fleet effectiveness of a naval enemy, and yet be feeling the stress of a greatly restricted commerce resultant on the destruction or seizure of a few of our merchant ships by a single daring enemy that has successfully evaded all attempts at capture. Lines of cruisers from the Land's End to Pernambuco, from Port Said to Gibraltar, from the Cape of Good Hope to Vancouver might be provided by an ungrudging people, and yet the news could well come in that "the s.s. *Briton*, bound from China to Peru, has been sunk by an armed liner, believed to be the *Vaterland*, flying the Portuguese flag." What would our "lines of cruisers" avail to prevent the rocketing movements of mercantile insurance, to 'suage the panic of single-ship-owners who (with wife and children to maintain) could afford no risk to the family (and only) means of livelihood? Nor would assurances of immunity from Whitehall dam the inevitable panic, for what use are they if lines of cruisers fail?

To what does all this lead us? The answer is simple—it brings us to realise the blatant absurdity of spending millions on "cruisers for commerce protection," it crushes for ever those who deplore

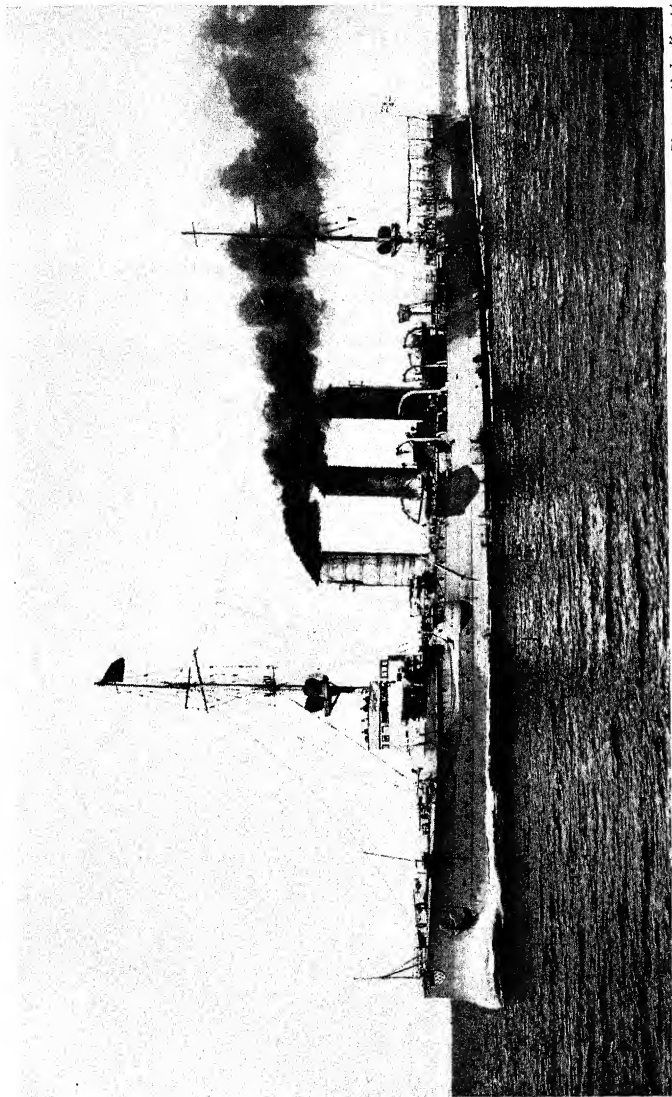
the absence of numerous protected cruisers from our recent naval programmes and turns our minds to consider whether there is not a more sensible means to an essential national end. The problem to be solved is twofold : first, shipowners must be relieved of all incentive to panic should a chance ship or two (or even fifty, for we have some 11,500 of over 100 tons measurement flying the British flag) be destroyed or taken ; secondly, a permanent antidote to attack must be provided in a manner at once effective, practical and economic in principle. The former of these is capable of many solutions. Merely as a suggestion, I throw out here the idea of State-Insurance-at-Peace-Rates during war time. This may present difficulties, it does possess advantages ; moreover it is open (as an idea) to development and negotiation. Adequately to discuss the latter of these two problems we must, to begin with, find an answer to this question " From what have our merchant vessels to fear attack ? "

" German cruisers, of course ! " shrieks someone, in a hurry, and knowing nothing. Such an answer (and I have had it from audiences, many and many a time) suggests (a) that Germany has cruisers capable of the work, (b) that we have only to think of Germany. But the cruiser question as touching our commerce is a persistent and a national question ; to-day (I admit it) Germany is the governing factor in many of our ideas of defence and offence, what

of twenty, fifty or one hundred years hence? Again, I would say neither Germany nor any nation (barring ourselves) possesses in this year of Grace, 1913, a single cruiser equipped or suitable for commerce attack—nor are any such under construction for any power in the world! An effective commerce destroyer (or protector) must be able to keep the sea for long periods—this necessitates big fuel capacity, large provision for stores, etc.; she must be swift—this requires high engine power and heavy displacement so that her mobility may not suffer in rough weather; she must be able to man and bring into port captured vessels should necessity arise—needing big crews and, therefore, extensive accommodation. Observe the biggest “cruisers” building to-day:—

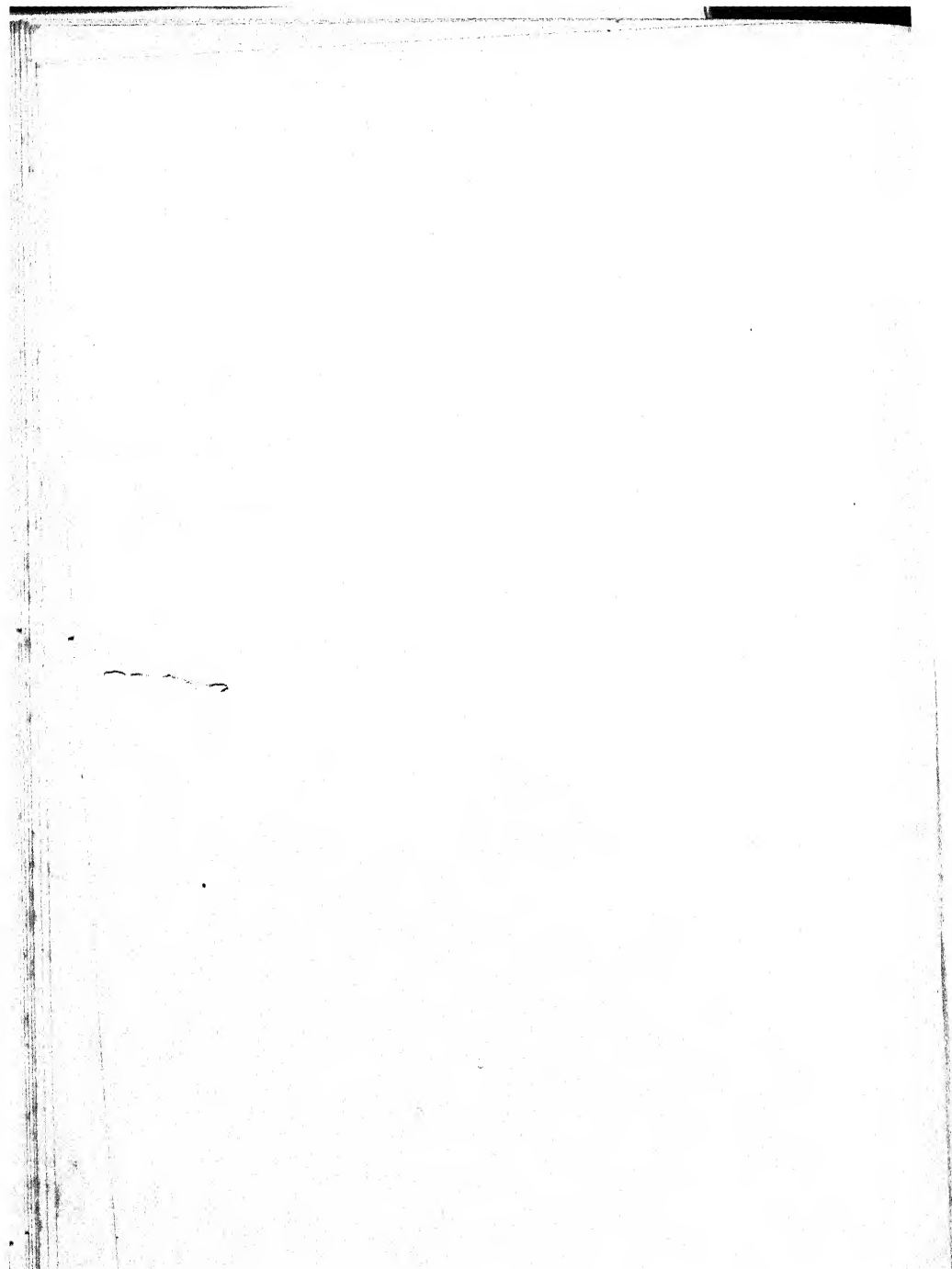
Country	Type	Displacement
Great Britain . . .	<i>Nottingham</i>	5,440 tons
Germany	<i>Rostock</i>	4,820 ”
Italy	<i>Marsala</i>	3,380 ”
Austria	<i>Helgoland</i>	3,500 ”
Russia	“ A ”	6,000 ”

America, Japan, France, Spain, etc. nil! The speed of the fastest *on trial* is in the region of thirty knots, this in smooth water, shallow water, picked water, and not loaded down to service draught. To attain such velocity, which is only meant for use in short, sharp spurts, these ships are perforce veritable boxes of machinery; all other spare room is taken up with guns and ammunition—they like to be in port



Photograph by Krupp

GERMAN LIGHT-CRUISER "CÖLN"



about once every three days. But what are their qualifications? They could cross the Atlantic, 3,000 miles, at thirteen knots—perhaps! The *Mauretania* and *Lusitania* do days on end at double that speed, and their displacement is about 75,000 tons! We may really dismiss the protected type of cruiser, therefore, from our minds.

A passing comment here may be made on a few units which were especially designed for commerce attack in the past; it cannot be said that any British vessels were so constructed, though many of them are quite fitted for the work. France and the United States do claim to have built cruisers with this end specifically in view, and the most notable of the Gallic examples are the *Châteaurenault* and *Guichen*. The former of these was launched in 1898, and has a displacement of 7,898 tons; with 23,000 designed horse-power she was intended to steam in service at 23 knots. She attained 24·545 knots with I.H.P. 24,064 for one brief hour and has been so successful in doing nothing ever since that she is now converted into a mine-layer! The *Guichen* displaces 8,151 tons and was launched in 1897, she reached 23·55 knots over a four hours' course. These two ships cost about £650,000 each, were and are useless as fighting craft, and have not the speed to carry out the purpose of their existence. But our neighbours have rare persistence and courage. "We will triumph," said they, "and obtain a ship both faster and

cheaper." They launched the 5,595-ton *Jurien-de-la-Gravière*, in 1899, and completed her at a cost of £476,000; the nearest she got to her designed 23 knots speed was 21.7 knots on a short burst. Thus France. The United States launched the *Columbia* and *Minneapolis* in 1892 and 1893—a great effort for that period. The first named attained 22.8 knots, the second 23 knots on trial, on a displacement of about 7,400 tons and 21,500 indicated horse-power. In a passage across the Atlantic, the *Columbia* maintained with great effort between 17 and 18 knots average for seven days. Thus America. More than ever, then, may we ignore the protected cruiser, built or building, as a menace to our commerce.

One other type of warship is deserving of mention, namely the big, modern, swift battle-cruiser. The argument here is beautifully restricted in that besides ourselves only Germany and Japan possess the type. But Germany's seven units (four ready or nearly so, the others in varying stages of construction) are a valuable and integral part of her heavy battle line; if she is to waste one or more of these hard-hitters on vessels incapable of retort in kind, then the rulers of her naval destinies are not gifted with that intelligence with which they are (and I think rightly) credited. Surely the cracking of a hazel nut with a steam-hammer is a proper analogy! Again, her battle-fleet will, should these vessels so be used, be

disadvantaged as against an opponent to the extent of their effective battle-value. It would, I venture to think, delight our strategists to learn that the *Moltke*, *Seydlitz*, etc., had rushed the Channel north about and were loose in the Atlantic; they would be free as the sky above them, I admit, but 'twould be the freedom of the naked little boy in the middle of the pond, with a policeman seated beside his clothes on the bank. Even the *Seydlitz*, *Moltke*, etc., must renew their fuel, and this is the day of wireless! How much tragedy for the monster battle-cruiser engaged in this way is wrapped up in these last few words. Japan has one battle-cruiser, the *Kongo*, complete, a second afloat, and two more on the stocks, these will be ready, as a division, in 1916. They are not built for commerce destruction or protection, except in so far as all warships, by their very being, tend to guard the trade of the nation to which they belong.

There remains, therefore, only one type of ship we need fear—the armed liner. Germany has some fifty merchant vessels of over 10,000 tons, half of these with speeds (real, dependable, continuous sea speeds) of 16 knots and over; ten of these can keep going at at least 22 knots. Ignoring all the rest, these ten, armed with a few light guns each, could create a havoc along our trade routes beyond expression in words. Without an antidote, day after day wireless messages would speak out the news

of ships captured, robbed or sunk. This is a true menace and no small one at that ; luckily the meeting of it is as easy as its creation, and just as ready to hand. Like must meet like. We in this country have over 150 vessels of 10,000 gross tons and upwards, some score of them steam 22 knots or more, and about half the total steam over 18 knots. If they, or a proportion of the best of them, be also armed with a few small guns, as is being done, then fear of commerce destruction should pass into history.

“ Trade Routes ” are clearly defined—they stretch from port to port as precisely as the main street of a modern town pierces the heart of its existence. Here only will merchant ships be found, and where the merchant ships are, there will the commerce-destroyers be gathered together. If the lines of commerce be diverted, the chances of the commerce-destroyer are appreciably lessened. Now, should a merchant-ship commerce-destroyer (armed) meet a British merchant-ship commerce-protector (armed), will there be a fight ? One shell, a three-pounder even, would wreck either if it pierced the engine-room ; and in merchant vessels it would be difficult to say the vitals are below the water-line ! They are all built for trade, warlike considerations are not in the minds of their designers when setting out the plans. The conclusion to be drawn from all this is written on every line of the argument, that the first of the old reasons for cruisers, i.e. protecting the

trade routes, is dying, if not dead. Let it be said, most pointedly, that the best way to keep hostile warships from attacking our trade terminals, if such were or could be attempted, is to prevent them leaving their native harbours.

B.—SHOWING THE FLAG

Showing the flag is the second *raison d'être* of cruisers, and it were well, at the outset, to lay emphasis on this, that this duty is even more important to-day than ever before; the sole question at issue is whether cruisers are needed in large numbers for the purpose. Let me now deplore the fatal re-iteration of that utterly untrue assertion that our interests are neglected in all waters outside the Channel. What do we constantly hear, yes, and read in reputable organs of the Press? "German cruiser to the rescue; fatal loss of prestige owing to withdrawal of British cruisers!" "Defenceless Britishers attacked by a mob; no British cruiser within a million miles!" "Disaster at Ping-Chung, Chinese cruiser first on scene. What is British Admiralty Doing!" and so on and so forth.

First, we will deal with the genesis of this attitude and then the facts. The genesis is to be found in the much quoted "courageous stroke of the pen" when some 150 aged and obsolete vessels of heterogeneous kind were supposed to have been swept to their proper destination, the scrap-heap, with a great

WHAT OF THE NAVY?

and fell swoop. The net result was manifold, chiefly the release for more useful work of some thousands of capable officers and men from sloops, gunboats, coffin-ships and death traps in which they were rapidly forgetting all their knowledge of the modern navy; secondly, a very proper saving in expense as regards stores, administration and upkeep. It is possible that the "swoop" was a little too drastic,—the refitting of some of the then condemned ships suggests this; but its general value no thinking man can or does dispute. Then came the cry, baited with irrelevance and dangled before the ignorant or prejudiced, of "one hundred and fifty cruisers removed from the Trade Routes without being replaced!" Well, they were *not* "cruisers" as a total, by any means, and the suggestion that they left foreign waters denuded is wholly unjustified. The figures given below are taken from a return issued to the House of Commons, and we find three distinct categories, i.e. (1) Ships of comparatively

	1	2	3	Totals
Battleships	4	Nil	6	10
Armoured Cruisers . .	4	—	6	10
Protected Cruisers . .	15	4	22	41
Sloops and Gunboats . .	1	29	2	32
Torpedo Gunboats . .	3	2	8	13
Totals	27	35	44	106

small fighting value, whose armaments have not been surrendered, (2) Ships which are available for sub-

sidiary purposes of war, and (3) Vessels obsolete or for sale.

The total of vessels capable of steaming was thus little more than two-thirds of the number advertised as wrongly removed; true, a series of old store-ships, hulks, mud-hoppers, sea-lumber, etc., helped to swell the total. But remark just these few points: of the fifteen protected cruisers in the first category, half a dozen are even now doing useful work as mine-layers; again, the "armoured cruisers" (save the mark!) included the aged *Northampton*, the decrepit *Warspite*, and even the prehistoric *Hector*, launched about 1863!

All this in 1905, and complained of! May we hope to have heard the last of these time-worn veterans as a means of proving a shortage of cruisers to-day? One final question: Has ever a critic, using the argument as above, stated definitely and specifically how many of the 150 odd craft were "withdrawn from protecting the Trade Routes"? I doubt it.

So much for the genesis of the plea, now for the facts.

Is our flag never seen, and should we, were war to break out, suffer a series of shattering blows in distant waters from foreign ships stationed there? The list given below is from the German "*Taschenbuch der Kriegsflotten*" for 1913, a reputed reliable work. We will start with the **Far East**:—

WHAT OF THE NAVY?

	Great Britain	Germany	U.S.A.	France	Russia	Austria
Battleships . . .	1	—	—	—	—	—
Armoured Cruisers . .	4	2	1	2	—	1
Protected Cruisers . .	4	2	2	—	2	—
Gunboats . . .	15	7	9	6	2	—
Destroyers . . .	8	1	5	3	8	—
Torpedo Boats . . .	4	1	—	14	11	—
Submarines . . .	3	—	4	2	12	—

Japan, of course, has her whole fleet there, and Russia has eighteen patrol vessels on the Amur.

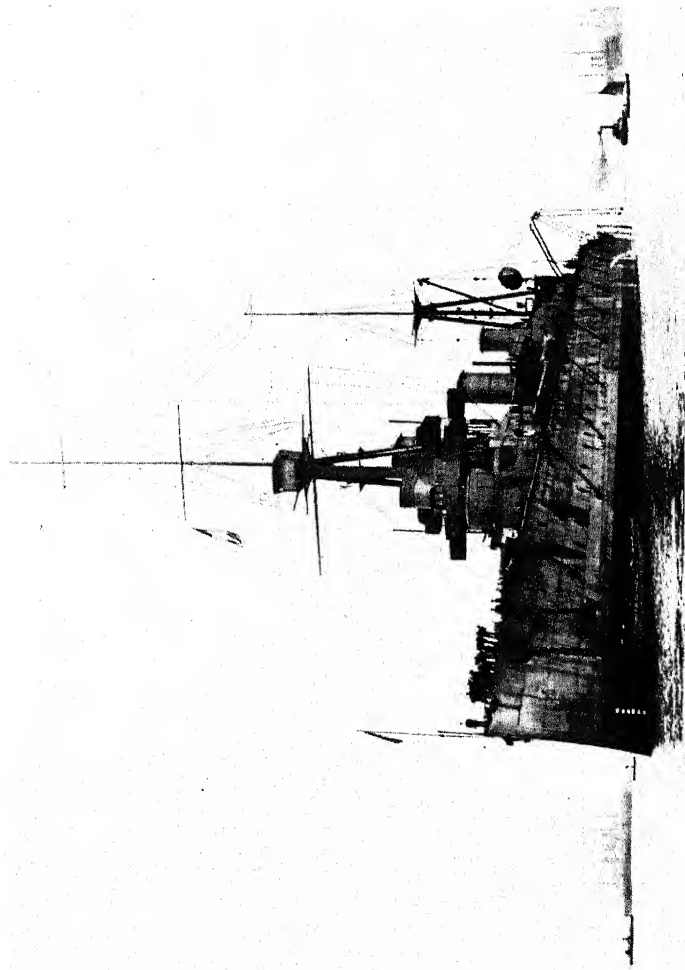
Moving south, what do we find in **Australia** and the East Indies ?

	Great Britain	Germany	France	Holland
Armoured Cruisers . .	1	—	—	A considerable flotilla of coast defence ships, small cruisers, torpedo craft and gunboats, many quite modern and thoroughly serviceable.
Protected Cruisers . .	11	3	1	
Gunboats . . .	6	—	1	
Destroyers . . .	3	—	—	
Torpedo Boats . . .	—	—	—	

And that's all.

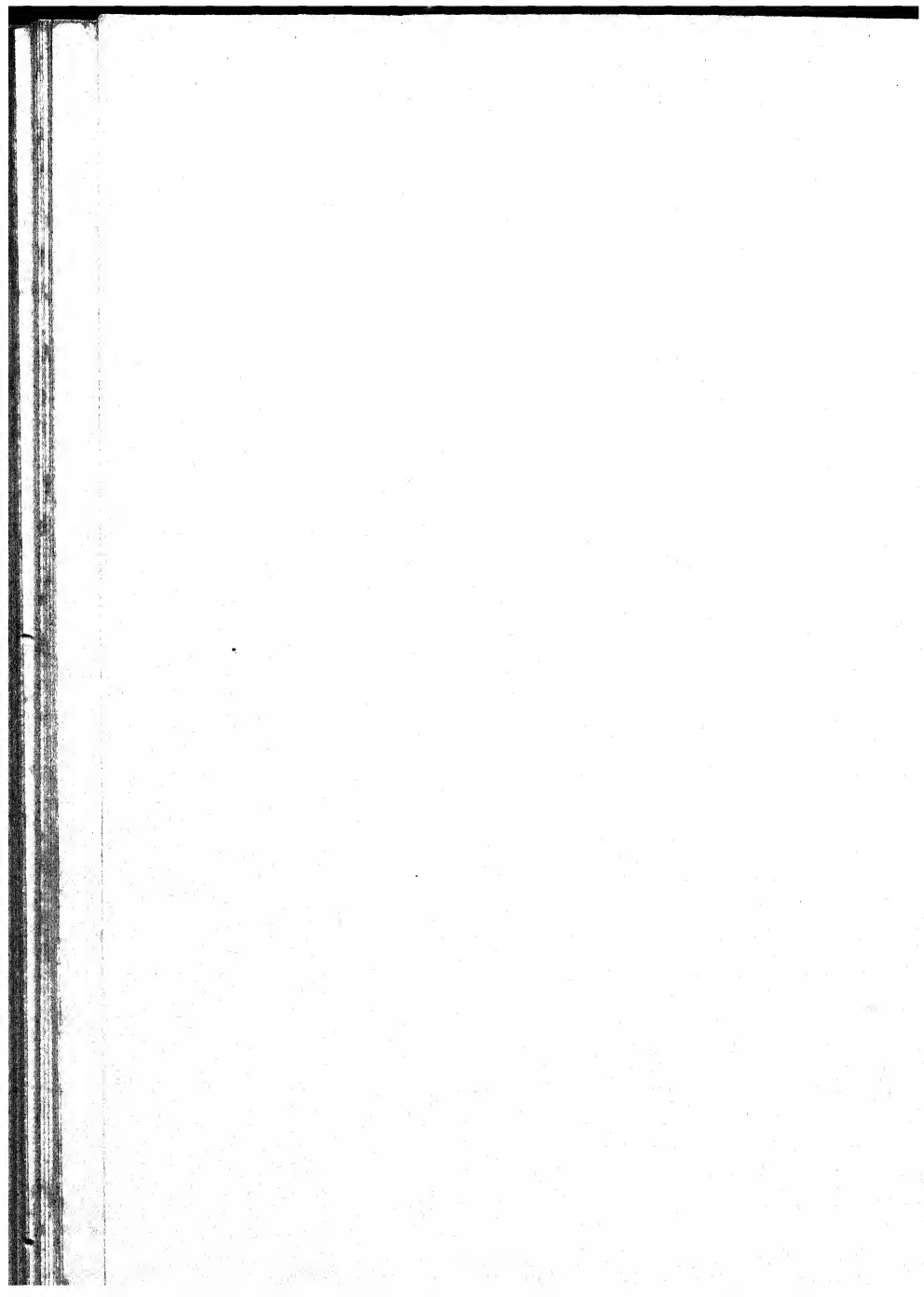
Turning to the **Cape of Good Hope** and **Africa** the relative strength shown is :—

	Great Britain	Germany	France
Protected Cruisers . .	4	2	—
Gunboats . . .	2	3	1
Torpedo Boats . . .	—	—	2



Photograph by G. Hest & Son, Southsea

H.M. BATTLE-CRUISER "NEW ZEALAND"



Around North America and the West Indies there are :—

	Great Britain	Germany	France
Protected Cruisers .	4	1	1
Gunboats	—	—	—

Here the United States reign supreme.

Now it is not intended by this enumeration to admit that the provision made is necessarily above criticism, but at least we hold our own in the matter of flag-waving as against the nations of Europe. By the time this appears in print, the battleships *Triumph* and *Swiftsure* will be at Hongkong and Singapore, an appreciable and notable addition to our fighting strength in Eastern waters when taken in conjunction with the large battle-cruiser *Australia*, and her lesser sisters, *Melbourne* and *Sydney*, in the Antipodes.

The really vital question is how Imperial prestige can best be maintained? Surely the answer is written large on the page of Dominion naval progress, a page as glorious as any to be found in the book of our national patriotism. Australia, New Zealand, the Federated Malay States (and doubtless, ere long, Canada, Africa and India) have come forward with a superworthy quota to our sea-forces, and it is these that should scour the mighty oceans, they it is that

should flaunt the pride of our race before those that have eyes to see, theirs is the duty of holding aloft the esteem that others before have gained. An Imperial Patrol, shall it be—this has quite a swing in itself as a title; the mighty craft composing it would be the hitting power behind the lesser ships now on the various stations, these last being the dust of our home fleet pressed at their obsolescence into a useful and national work for which in their passing years they would be admirably fitted! This is the ideal. When will it be attained?

C.—ACTING WITH THE BATTLE-FLEET

Nelson's cry was always for more frigates—but all things are relative. The cruiser was then and is still the "eye" of the battle-fleet, until displaced by air-craft. In Nelson's time the limit of human vision was just what it is to-day, so that adequately to search a wide expanse of sea for an enemy and permit of each ship engaged in such search being within visual touch with her next nearest (forming thus a long chain of knowledge from the admiral to his outermost line) it obviously was necessary to have at command a force distinguished more by quantity possibly than by quality. To-day wireless telegraphy largely negatives the necessity for numbers where "scouting" work is concerned; to-day one fast ship meeting a hostile force can convey accurate and speedy information to her battle-division through the

air and at the same time save the admiral much complexity in his command. Before the advent of wireless a proportion of two protected cruisers to each *battleship* was regarded as the minimum permissible, now two cruisers (or scouts) to each *fleet* is a nearer approximation both to the truth and the needs. In effect it will be astonishingly hard for a battle-fleet to lose itself, since each new invention would seem to narrow the vast spaces of the ocean. Paradoxically, however, whilst the value of the cruiser as "fleet-scout" has almost disappeared, its essentialness to the battle-fleet for quite another purpose is growing more and more evident.

The "villain of the piece," in this transformation, is the torpedo. This weapon has developed at so astonishing a rate that 5,000 to 7,000 yards is being spoken of as an effective range for its use. Parallel with its progress we have to note big strides in the design of vessels fitted to discharge it; destroyers are as large as formerly were small cruisers, 1,000 tons is no longer looked at with wide-open eyes as a displacement of madness, whilst there are ship-builders quite prepared to build such craft with a guaranteed speed of 40 knots, or nearly fifty miles an hour. Destroyers are the bane of the battleship; the battleship (the modern ship-of-the-line) is still and will remain Lord of the Sea. Remove the battleship, then, and you remove naval supremacy. We must, therefore, seek the most practical means of

meeting their greatest menace. A secondary battery (small quick-firing guns placed in convenient, or inconvenient places in battleships) has proved a weak reed on which to place reliance. Destroyers moving at forty miles an hour on a pitch-black night in a bumpy sea are not easy marks. This much a secondary battery does do: according to the calibre of the weapons of which it is composed, so is the range of destroyer attacks largely controlled. With only 4-in. guns to face, destroyer commanders will make a dash at 3,000 yards, or less; but the 6-in. gun, firing a 100-lb. shell, is a tougher proposition, requiring further thought—and more discretion. It will be seen from this that the menace to the big ship is very real, and that any attempt to meet it by the vessel attacked still permits of a large margin of risk. The wise course is to sink the attackers before they get within range; this, and this only, is the true and proper work of the newly created light-armoured cruiser. What is this novel class of vessel? It is a hybrid outcome of changing conditions possessing these unique qualities:—

1. Sufficient speed to run down the fastest destroyer except in perfectly calm water.
2. An armament against which no destroyer built or projected could stand up.
3. Protection along the sides to keep out the shells of any gun as yet mounted in destroyers and, except at close range, proof to the 6-in. weapon.

4. A displacement enabling them to hold the sea long after stress of weather has driven the largest destroyers into shelter.

This type is to be the screen of future battle-fleets.

There are sixteen of these cruisers under construction for our fleets—sixteen little demons of war to stand between the mighty battleship and its natural pest, the destroyer. The displacement is round about 3,600 tons, the speed 30 knots, and the armament includes guns both of 6-in. and 4-in., calibre. They will burn only oil, and within their frail hulls will pulsate the engine-power of a mighty battle-cruiser. Woe betide the division of destroyers into which they should happen to drive, drive all out, with death-spitting guns! What will the hostile shells avail, mere peas, splitting innocuously against the hard sheathing of their swift attackers. It is another revolution in the wheel of constant change, for who shall say the light armoured cruiser will not in time become the bane of the mastodon battleship still unbuilt—did not the destroyer, instituted to annihilate the torpedo-boat, drive this latter class to obsolescence and take its place in all its functions?

And, finally, let us see how we stand in cruiser matters. Taking as our text the new Admiralty classification, and differentiating at the same time between "armoured" (those vessels protected by

vertical side armour) and "protected" (those not so defended), we find:

	Cruisers		Light Cruisers		Total
	Armoured	Protected	Armoured	Protected	
British Empire . . .	34	17	16	78	145
Germany	9	6	10	33	58
France	19	2	—	10	31
U.S.A.	15	—	—	16	31
Japan	9	—	—	21	30
Italy	7	—	3	11	21
Russia	6	—	—	14	20
Austria	3	—	—	12	15

This is the tale of the built, the building and the immediately projected. It covers a wide range in type, size, age and battle-value, but of course excludes battle-cruisers.

CHAPTER VI

ON THE DEVELOPMENT OF TORPEDO CRAFT

WHEN, nearly fifty years ago, Captain Luppis, of the Austrian Navy, and his mechanic, Mr. Whitehead, completed the first automobile torpedo, it may be doubted whether a single living man realised to what extent the development of this weapon would affect the evolution of the fighting ship. Enthusiasts there were, of course, who promptly condemned the battleship as of a past age—yet the far-seeing, though not guessing the whole truth, knew that history would but repeat itself, and that man's inventive genius must assuredly discover an antidote to that which it had but just evolved. The torpedo was *in esse*—this, at least, was a solid fact, and most naturally the best means for its employment for purposes of war came under immediate consideration. As a weapon it proved erratic, untrustworthy and immature, but the idea teemed with the germs of possibility, and each month saw improvements added to its mechanism: each rebuff by incredulous naval committees augmented the enthusiasm of its inventors.

The necessity of "closing" the ship to be tor-

pedoed temporarily limited the size of the attacking boat carrying the new projectile; its range in those early days was but a few hundred yards, and then, as now, the nearer you were to your victim at the moment of discharge the better chance would there be of success. Launches had already been utilised for spar torpedo work, these being mere bundles of explosives, cunningly fixed upon the end of a pole, the length of which was the limit of range—what more natural than that slings should be fitted upon either side of such launches for the new automobile torpedoes? These craft were small, speedy (for their day), and handy. They employed few men and cost a minimum price.

Meanwhile the torpedo was developing; its speed had been doubled, and its erratic characteristics checked by internal balancing mechanism of improved type. We ourselves purchased the invention for £15,000, but whilst some years previously we might have become the sole owners, we now were only sharing in the knowledge with the rest of the world. The Norwegians it was who first emphasised the importance of the new weapon by ordering from Messrs. Thornycroft and Company, then of Chiswick, a boat designed solely for torpedo work. This was in 1873, and, with a displacement of $7\frac{1}{2}$ tons and a length of 57 ft., she steamed 14·97 knots on the measured mile. It was in 1877, however, that a spurt in specialised craft became evident both at home and abroad, for

DEVELOPMENT OF TORPEDO CRAFT III

we then built our *Lightning* (also at Messrs. Thornycroft's yard), and the Russian Government ordered no fewer than 100 similar vessels, many from German firms. The *Lightning* reached 19 knots on trial, in place of the 18 knots contracted for, and, gratified at this excellent result, the Government in 1877 and 1878 placed orders for twelve further boats to steam 18·5 knots on trial. Messrs. Yarrow had by now entered the lists, and this firm, with that of Thornycroft's, will ever stand out as having done more than any other to develop torpedo craft. With a load of $6\frac{1}{2}$ tons, the boat built by Messrs. Yarrow attained a speed of 21·94 knots, and this, compared with the speeds of contemporary battleships (*Téméraire*, completed 1877, 14·67 knots; *Superb*, completed 1880, 13·71 knots), was very creditable, and corresponds roughly to the relative speeds attained by battleships and destroyers to-day. (*King George V.*, completed 1912-13, 22 to 23 knots; *Acasta* class of destroyer, 31 to 34 knots.) In 1879 Messrs. Yarrow sent Russia the 100-ft. *Batoum*, which, with 500 I.H.P., had reached over 22 knots. Progress was rapidly being made.

It is not intended here to dwell at too great length on the history of these craft; enough has been said to show that a course had been entered upon from which there could be no turning. So swiftly did development proceed that differentiation into classes was perforce introduced, and whilst torpedo boats of the first class were of such a size as to make lengthy sea voyages

feasible, second-class boats for harbour and coast defence were also being built. Our own Government, neglecting the larger classes, showed a penchant for tiny vessels of 17 tons, 200 I.H.P., and 17 knots speed, and in 1884 the first-class boats possessed by important Naval Powers totalled the following :—Russia 115, France 50, Holland, 22, Great Britain 19, Italy 18, Austria 17. These figures would appear to have startled the authorities, as well they might, and four large boats were ordered from the two Thames firms mentioned above. In 1885, fifty-four additional units were ordered to be laid down, and two more, built as a speculation, were purchased by a special vote. Mr. White, a ship-builder of Cowes, with a yard at the mouth of the Medina, obtained the contract for five of these vessels, and the White-built boats have maintained a foremost place ever since. The units of this series had a length of from 113 to 127 ft., and steamed from 21 to 22 knots on trial with a designed I.H.P. of 700.

Every Power with naval aspirations, excepting only the United States, was now feverishly constructing torpedo boats; the possibilities of the torpedo obsessed the minds of everyone to the exclusion of more reasoned moderation, and the boats, moreover, were cheap and speedily built. It is worthy of note that Messrs. Yarrow in 1885 put afloat the *Kotaka*, the first armoured torpedo boat for Japan, but the idea conveyed in her design has even yet not been

DEVELOPMENT OF TORPEDO CRAFT 113

generally followed up, though France has a few lightly armoured destroyers. Speed was annually increasing, and 24 knots had frequently been reached and surpassed; the greater efficiency of the torpedo itself, and its longer range and augmented velocity, removed much of the necessity for smallness of target. Hence designers, realising that improvement in sea-keeping qualities, speed, engines and armament, could not be effected without a corresponding increase in displacement, were rapidly reaching the hundred tons. The *Lightning* had been 84½ feet long, the *Kotaka* was 166 ft. in length. As the '90's drew near, torpedo boats were numbered by many hundreds, and to our total of 206, Russia and France (the Two-Power-Standard of the day) could show no fewer than 353, whilst Germany possessed 180, and Italy 152. The obvious menace to a battle-fleet in the narrow seas from the swarms of these craft that might conceivably be hurled at it, produced, in the first place, the torpedo net—a crinoline under-water defence for large ships—and secondly the almost inevitable torpedo-catcher, or torpedo-gunboat. This, roughly described, was a vessel of varying displacement from 500 to 1,000 tons, possessing a legend speed of 19 to 22 knots and an armament of one or two heavy quick-firers, several lighter weapons, and a few deck torpedo tubes. As a type, they entirely failed to fulfil expectations, whether built for us or for foreign nations. They lacked speed, and even their greater

BRITISH AND FRENCH TORPEDO GUNBOATS

Type :	Rattle-snake	Sharp-shooter	Gossamer	Circe	Halcyon	Sainte Barbe	Leger	Casa-bianca	La Hire
Nationality	British	British	British	British	British	French	French	French	French
Date of Launch	1886	1888	1890	1892	1894	1890	1891	1895	1899
Displacement	550 tons	755 tons	735 tons	810 tons	1,070 tons	430 tons	509 tons	974 tons	389 tons
Length	200 ft.	230 ft.	230 ft.	230 ft.	250 ft.	193-6 ft.	199 ft.	263-5 ft.	256 ft.
Beam	23 ft.	27 ft.	27 ft.	27 ft.	30-5 ft.	19-7 ft.	33 ft.	28-75 ft.	27-75 ft.
Draught	8-5 ft.	8-3 ft.	8-25 ft.	8-75 ft.	9 ft.	10-5 ft.	10-5 ft.	11-5 ft.	12-75 ft.
Designed I.H.P.	2,700	3,500	6,000	6,000	6,000	1,800	2,500	5,000	7,000
Designed Speed	18-5 kts.	20 kts.	20 kts.	21 kts.	19 kts.	18 kts.	19 kts.	21 kts.	23 kts.
Armament	{ 1 4-in. Q. 6 3-pr. Q.	{ 2 4-7-in. Q. 5 3-pr. Q.	{ 2 4-7-in. Q. 5 3-pr. Q.	{ 2 4-7-in. Q. 4 3-pr. Q.	{ 2 4-7-in. Q. 5 6-pr. Q.	{ 7 Small Q. —	{ 1 3-9-in. Q. 7 Smaller Q.	{ 1 3-9-in. Q. 12 Smaller Q.	{ 6 9-pr. Q. 6 Smaller Q.
Torpedo Tubes	2	2	4	5	5	2	32	2	Nil
Complement	67	91	91	91	120	70	89	143	123
Coal Capacity	100 tons	100 tons	100 tons	100 tons	100 tons	70 tons	130 tons	116 tons	137 tons

DEVELOPMENT OF TORPEDO CRAFT 115

TORPEDO GUNBOATS OF OTHER NATIONALITIES

Type:	Tripoli	Jagd	Iride	Comet	Takusa	Capera	Abreck	Agordat	Berk-i-Salvet
Nationality	Italian	German	Italian	German	Japanese	Italian	Russian	Italian	Turkish
Date of Launch	1886	1888	1891	1892	1894	1895	1896	1899	1906
Displacement	885 tons	1,253 tons	931 tons	971 tons	875 tons	838 tons	535 tons	1,292 tons	775 tons
Length	280 ft.	262.5 ft.	229.5 ft.	234 ft.	240 ft.	230 ft.	212.25 ft.	287.5 ft.	262.5 ft.
Beam	25.75 ft.	31.25 ft.	27 ft.	31.25 ft.	27.5 ft.	27.25 ft.	24.75 ft.	30.5 ft.	27.75 ft.
Draught	11.75 ft.	13.75 ft.	10.25 ft.	13.75 ft.	13 ft.	10.25 ft.	9 ft.	11 ft.	8.25 ft.
Designed I.H.P.	2,500	2,800	4,200	5,000	5,500	4,000	4,000	8,000	5,000
Designed Speed	18 kts.	18 kts.	19.5 kts.	21 kts.	21 kts.	21 kts.	21 kts.	22 kts.	22 kts.
Armament	7 Small Q.	4 8.4-in. Q. 2 Machine	1 4.7-in. Q. 8 Smaller Q.	4 3.4-in. Q. 2 Machine	2 4.7-in. Q. 4 8-pr. Q.	2 4.7-in. Q. 6 Smaller Q.	2 3-in. Q. 4 Smaller Q.	4 4.7-in. Q. 10 Smaller Q.	2 4.1-in. Q. 13 Smaller Q.
Torpedo Tubes	4	3	6	3	5	5	2	2	3
Complement	107	141	111	115	100	111	109	158	105
Coal Capacity	130 tons	230 tons	120 tons	130 tons	200 tons	120 tons	97 tons	160 tons	240 tons

displacement did not lend them excessive stability in a sea-way.

Their failure had this much of good in it, however ; it necessitated a change of policy along more practical lines. Obviously the development of torpedo boats would, if allowed to proceed naturally, lead to larger, swifter and better armed craft of practically identical type. The Admiralty took a wise course, and, bridging the evolution of, maybe, a dozen years, placed their first order for "destroyers" (the name that has clung to the type ever since) in 1893. These craft, though but a quarter the size of the "ocean-going" destroyers of to-day, were yet more than twice the displacement of the torpedo-boats they were designed to destroy. Let it be said here that the "destroyer" undoubtedly came into existence primarily as an antidote to the French torpedo-boats, and their success and speedy multiplication rendered at least a quarter of our neighbour's small-craft immediately obsolete. The same largely applied to those possessed by other European nations, and our policy of type initiation bore the excellent fruit that has ever fallen to our lot, as instance the more recent cases of the battleship *Dreadnought*, the battle-cruiser *Invincible* and the Tribal class of destroyer. We promptly established a lead, and in the obtaining of this lead we added vastly to the experience in the use of the new craft, experience profiting naval officer and designer alike.

DEVELOPMENT OF TORPEDO CRAFT 117

It was at this point that the submarine boat came prominently to the fore—for the first time an efficient type, the *Gymnôte* and *Gustave Zédé* (the first of that name), had shown that the new arm must undoubtedly be reckoned with in the future, and could no longer be silently ignored as in the past. Yet it was not until a new century had dawned that the British officials took definite steps to prove their value for themselves in a practical manner. It is not the writer's intention to discuss here the submarine development of the world, but it may justly be said that the steady progressive policy pursued in the construction of these craft since the first five small vessels were built in 1901-02 has given to Great Britain a fleet of under-water craft unequalled either in efficiency, general design or real battle-value by any other nation. Of their possible final development a word is said later, but for the present it is better to follow the evolution of surface torpedo vessels. Their general acceptance into all navies did no little towards developing the secondary and tertiary batteries of ships of the line, and as years advanced the menace they held out to their greater brethren received more and more definite recognition. From the 3-pr. Q., 1-pr. Q. and machine gun to the 6-pr., 12-pr., and now the 4-in. Q., is but a step, yet each advance in calibre has been induced by the growing effectiveness (or possible effectiveness) of torpedo craft, whether destroyers, torpedo boats, or sub-

marines. Destroyers, as years advanced, developed along ordinary lines, until in 1897 such portion of the British public as was present at the Naval Review were astounded by the meteoric appearances of the speedy little *Turbinia*. From the advent of Sir Charles Parsons' astonishing yacht, destroyers diverged and their development followed two distinct branches, those propelled by turbines and those still dependent upon reciprocating engines; it required no great intuition to realise that the latter type was working towards finality, and that in the former would be found the steam motive-power of the future, or until such time as electricity or the internal combustion engine shall have proved its superiority. The table on p. 119 is instructive.

And here end the British destroyers propelled by the old system of machinery. It may be remarked that the armament altered very little when once the type had been established; the solitary 12-pr. was mounted forward, and the 6-pr. Qs. arranged two on either beam and one aft. In the contemporary Japanese boats, the 12-pr. Q. was placed aft, and this position was found the more satisfactory until the 6-pr. Qs. were almost all removed and replaced by a lesser number of 12-pr. Qs., the smaller weapon being found of but slight value. The sudden leap in displacement in 1901-03 was due entirely to the unfortunate loss of the turbine destroyer *Cobra*. The late Sir William White, K.C.B., F.R.S., formerly Chief Constructor

DEVELOPMENT OF TORPEDO CRAFT 119

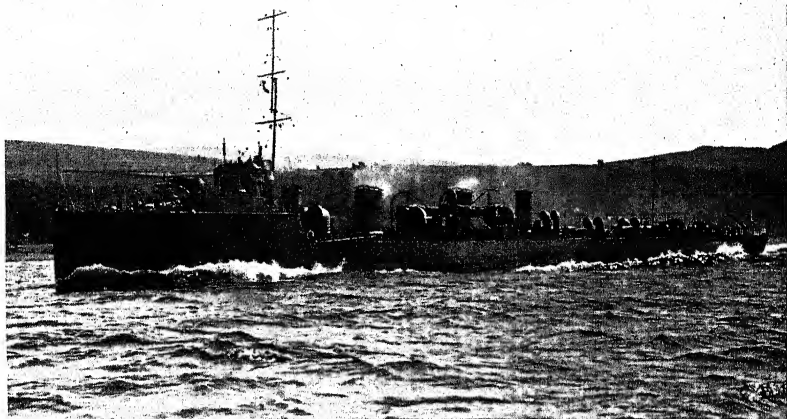
TABLE SHOWING THE DEVELOPMENT OF THE TORPEDO-BOAT DESTROYER,
1893-1905

Name :	Harack	Ardent	Brazen	Albatross	Arab	Waveney	Garry
Date of Launch	1893	1894	1896	1898	1901	1903	1905
Displacement	240 tons	205 tons	345 tons	430 tons	470 tons	534 tons	590 tons
Length	180 ft.	201 ft.	218 ft.	227-6 ft.	218 ft.	220 ft.	222 ft.
Beam	18-5 ft.	19 ft.	20 ft.	21-25 ft.	20 ft.	23-5 ft.	23-5 ft.
Draught	5-25 ft.	7-3 ft.	5-6 ft.	8-5 ft.	5-6 ft.	10 ft.	9-6 ft.
Designed I.H.P.	3,500	4,500	6,000	7,500	8,500	7,000	7,500
Designed Speed	26-5 kts.	27 kts.	30 kts.	32 kts.	32 kts.	25 kts.	25-5 kts.
Trial Speed	26-77 kts.	27-97 kts.	29-565 kts.	31-552 kt.	31 kts.	25-62 kts.	26-51 kts.
Armament	{ 1 12-pr. Q. 3 6-pr. Q.	{ 1 12-pr. Q. 5 6-pr. Q.	{ 1 12-pr. Q. 5 6-pr. Q.	{ 1 12-pr. Q. 5 6-pr. Q.	{ 1 12-pr. Q. 5 6-pr. Q.	{ 4 12-pr. Q. —	{ 4 12-pr. Q. —
Torpedo Tubes	1	2	2	2	2	2	2
Complement	43	45	60	68	68	70	72
Coal capacity	57 tons	60 tons	80 tons	100 tons	100 tons	120 tons	126 tons

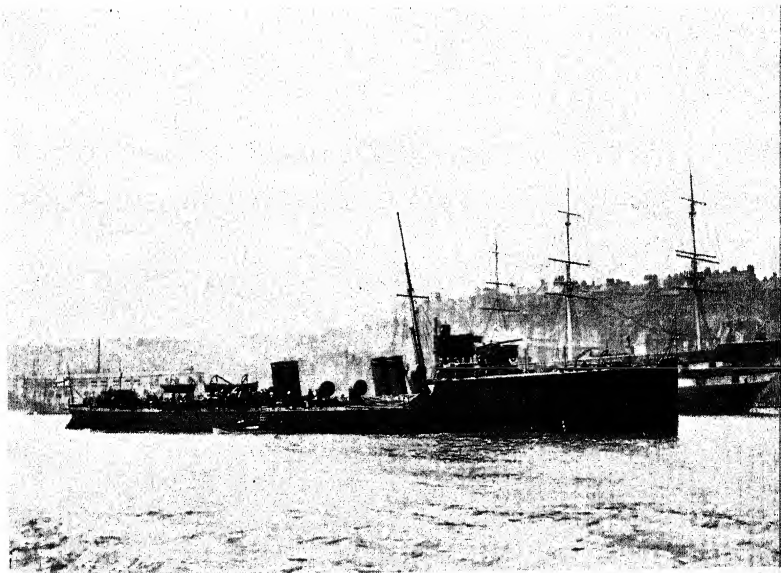
to the Admiralty, in the last of his Cantor Lectures, delivered on Feb. 26th, 1906, said of them: "Her (the *Cobra's*) loss led to the construction of another type of destroyer, with stouter hulls and heavier machinery in relation to power developed. These vessels are 225 ft. long, and $25\frac{1}{2}$ to 26 knots speed, with a displacement of 550 tons." This class, though excellent as sea boats, can hardly be called a success on account of their low speed. Yet they were and are favourites with naval officers, and this is a considerable recommendation. The *Garry* is included as being the last word, the final development of the reciprocal-engined destroyer. Though of the same engine-power as the other vessels of the River class, she is of slightly greater displacement and at least a knot speedier, these results being obtained by a special form of hull, particularly in regard to the stern.

Turning to Turbine craft we find the development shown in the table on p. 121.

Here we see the commencement of a new era. In the *Velox* and the *Eden* are examples of the turbine River class resultant on the *Cobra* disaster scare; though engined on the Parsons principle, steps have been taken so to mould the hull that a speed of more than 27 knots could not be obtained. For three years the critics, both naval and civilian, waged war against the policy of low speeds, and the Tribal class, represented in the table by the *Mohawk*, with all later



Photograph supplied by W. Denny & Brothers, Dunbar
H.M. DESTROYER "MAORI"



Photograph supplied by Palmers Shipbuilding & Iron Co.,
H.M. DESTROYER "WEAR"



DEVELOPMENT OF TORPEDO CRAFT 121

TABLE SHOWING THE DEVELOPMENT OF THE TURBINE-DRIVEN TORPEDO
BOAT DESTROYER, 1899-1907

Name:	Viper	Cobra	Velox	Eden	Mohawk	Ruby	Larcher	Conquest	Swift
Date of Launch . . .	1899	1900	1902	1903	1906	1910	1912	1913	1907
Displacement . . .	312 tons	400 tons	440 tons	540 tons	765 tons	780 tons	860 tons	952 tons	2170 tons
Length . . .	210 ft.	223 ft.	210 ft.	220 ft.	270 ft.	240 ft.	255 ft.	280 ft.	345 ft.
Beam . . .	21 ft.	20.5 ft.	23 ft.	23 ft.	25 ft.	25.6 ft.	25.7 ft.	27 ft.	34.25 ft.
Draught . . .	8.2 ft.	8.5 ft.	8.5 ft.	8.75 ft.	8.9 ft.	7.1 ft.	8.6 ft.	9.4 ft.	10.5 ft.
Designed I.H.P. . .	10,000	11,500	8,000	7,000	14,500	13,500	20,000	25,000	30,000
Designed Speed . .	31 kts.	31 kts.	27 kts.	25 kts.	33 kts.	27 kts.	30 kts.	31 kts.	36 kts.
Trial Speed . . .	37-113 kts.	38-63 kts.	27-124 kts.	26-22 kts.	35-294 kts.	30-23 kts.	35.3 kts.	—	38.3 kts.
Armament . . .	1 12-pr. Q.	1 12-pr. Q.	1 12-pr. Q.	4 12-pr. Q.	5 12-pr. Q.	2 4-in. Q.	2 4-in. Q.	3 4-in. Q.	4 4-in. Q.
Torpedo Tubes . .	5 6-pr. Q.	5 6-pr. Q.	5 6-pr. Q.	—	—	2 12-pr. Q.	2 12-pr. Q.	—	—
Complement . . .	2	2	2	2	2	2	2	4	2
Fuel Capacity . . .	66	62	63	70	60	72	72	100	150
	88 tons	107 tons	130 tons	130 tons	98 tons	88 tons	86 tons	140 tons	200 tons

TABLE SHOWING THE DEVELOPMENT OF THE TORPEDO BOAT

Type:	Lightning	No. 74	No. 039	No. 041	No. 080	No. 091	No. 098	No. 109	No. 6	No. 31
Date of Launch	1877	1882	1885	1886	1889	1894	1901	1902	1906	1908
Displacement	27 tons	17 tons	40 tons	60 tons	85 tons	130 tons	178 tons	200 tons	247 tons	280 tons
Length	84.5 ft.	60 ft.	100 ft.	127.5 ft.	130 ft.	140 ft.	160 ft.	166 ft.	166.5 ft.	178.5 ft.
Beam.	10.8 ft.	7.5 ft.	12.5 ft.	12.5 ft.	13.5 ft.	15.5 ft.	17 ft.	17.25 ft.	17.5 ft.	18.6 ft.
Draught	5 ft.	3.6 ft.	5 ft.	6 ft.	5.5 ft.	7.5 ft.	8.4 ft.	8.4 ft.	5.8 ft.	5.9 ft.
Designed I.H.P.	460	170	500	700	1,100	2,400	2,850	2,900	3,750 (T)	4,000 (T)
Designed Speed	18 kts.	17 kts.	19 kts.	20 kts.	22 kts.	23.5 kts.	25 kts.	25 kts.	26 kts.	26 kts.
Trial Speed	19 kts.	16.5 kts.	19 kts.	21 kts.	23 kts.	24 kts.	25 kts.	25 kts.	27.5 kts.	27.5 kts.
Armament	—	1 Machine	—	2 3-pr. Q.	3 3-pr. Q.	3 3-pr. Q.	3 3-pr. Q.	3 3-pr. Q.	2 12-pr. Q.	2 12-pr. Q.
Torpedo Tubes	1	2	1	4	3	3	3	3	3	3
Complement	15	7	15	15	19	18	32	32	35	35
Coal Capacity	7 tons	1 ton	10 tons	18 tons	20 tons	25 tons	20 tons	42 tons	20 tons, oil	30 tons, oil

DEVELOPMENT OF TORPEDO CRAFT 123

ships, is the result. These vessels are of a similar displacement to the later torpedo-gunboats; from them it is a mere step to the *Swift*, herself an experiment too expensive to be repeated. But whilst strides were being made with destroyers, torpedo boats also have been following the common bent in naval evolution, i.e. increased displacement, greater speed, stronger armament. It is, however, a mere flash in the pan of evolution, for the torpedo-boat in its old conception is dead.

This disposes of the British torpedo craft for the moment. Foreign vessels have increased in almost similar ratio and on p. 124 are a few typical examples of the latest types of both destroyers and torpedo boats, which may profitably be compared with the little *Havock*.

It will be seen from these tables how great an advance has been made in the last ten or fifteen years, and how even minor powers, with aspirations to naval strength, are following the general upward trend in displacement and other essential features. The torpedo boat of to-day is considerably larger than the earliest destroyer, whilst the latest development in these latter craft far out-classes the original torpedo-gunboats. Indeed, the fusion of type between the "scout" and the "destroyer" is the most natural outcome of the present development, and it is Japan that in this matter gave us the initial lead. Whether the future rôle of destroyers is to be that

TABLE SHOWING TYPICAL FOREIGN "DESTROYERS"

Type:	Sakura	Duncan	Bisson	Dersky	G 12	Troll	Munin	Douro	Cordoba	Parana	A. Lynch
Nationality	Japanese	American	French	Russian	German	Norwegian	Swedish	Portuguese	Argentine	Brazil	Chili
Date of Launch	1912	1913	1913	1913	1912	1912	1910	1913	1911	1910	1912
Displacement	790 tons	1,010 tons	750 tons	1,050 tons	840 tons	560 tons	430 tons	700 tons	890 tons	550 tons	1,850 tons
Designed I.H.P.	18,600 (T)	14,000 (T)	18,000 (T)	25,000	23,000 (T)	7,500	7,200	11,000	19,000	8,000	27,000
Designed Speed	33 kts.	29.5 kts.	31 kts.	34 kts.	32.5 kts.	27 kts.	30 kts.	27 kts.	32 kts.	27 kts.	31 kts.
Armaments	{ 2 4-in. Q. 4 12-pr. Q.	5 4-in. Q. 2 Machine	2 4-in. Q. 4 9-pr. Q.	3 4-in. Q. 4 Machine	2 3-in. Q. 2 Machine	6 12-pr. Q. —	2 12-pr. Q. 4 6-pr. Q.	1 4-in. Q. 2 12-pr. Q.	4 4-in. Q. —	2 4-in. Q. 4 3-pr. Q.	6 4-in. Q. 2 Machine
Torpedo Tubes	3 or 4	3	4	5	4	3	2	2	4	2	3

THE TORPEDO BOATS ARE AS UNDER:—

Type:	Kamora	Calliope	Penguin	Sjöbjörn	G 5	Elisaf	Goyaz	Merino Torpa
Nationality	Japanese	Italian	Austrian	Danish	Dutch	Turkish	Brazilian	Chilian
Date of Launch	1904	1907	1907	1898	1906	1904	1908	1902
Displacement	150 tons	200 tons	197 tons	142 tons	144 tons	165 tons	150 tons	130 tons
Designed I.H.P.	4,200	3,000	3,000	2,300	2,000	2,200	3,000	2,000
Designed Speed	27 kts.	26 kts.	26 kts.	23 kts.	25 kts.	26 kts.	26.5 kts.	25.5 kts.
Armament	{ 1 6-pr. Q. 2 3-pr. Q.	3 3-pr. Q. —	4 3-pr. Q. —	1 4.7 in. Q. 1 1-pr. Q.	2 3-pr. Q. —	3 3-pr. Q. —	2 3-pr. Q. —	—
Torpedo Tubes	3	3	3	3	3	3	2	2

DEVELOPMENT OF TORPEDO CRAFT 125

TABLE SHOWING THE EVOLUTION OF THE TORPEDO-BOAT DESTROYER
AND SCOUT

Class:	Torpedo Boat	Destroyer	Torpedo Boat	Torpedo Gunboat	Destroyer	Scout	Destroyer	Destroyer
Nationality	British	British	British	British	British	Japanese	British	Japanese
Type	No. 001	Ardent	No. 31	Rattlesnake	Garry	Mogami	Swift	Umitake
Date of Launch	1894	1894	1908	1886	1905	1907	1907	1910
Displacement	130 tons	205 tons	280 tons	550 tons	690 tons	1,329 tons	2,170 tons	1,150 tons
Length	140 ft.	201-6 ft.	178-5 ft.	200 ft.	222 ft.	316 ft.	345 ft.	300 ft.
Beam	15-5 ft.	19 ft.	18-6 ft.	23 ft.	23-5 ft.	31-5 ft.	34-25 ft.	—
Draught	7-5 ft.	7-3 ft.	5-9 ft.	7-5 ft.	9-6 ft.	9-75 ft.	10-5 ft.	—
Designed I.H.P.	2,400	4,500	4,000 (T)	2,700	7,500	8,000 (T)	30,000 (T)	20,500 (T)
Designed Speed	23-5 kts.	27 kts.	26 kts.	18-5 kts.	25-5 kts	23 kts.	36 kts.	33 kts.
Armament	—	1 12-pr. Q. 5 6-pr. Q.	2 12-pr. Q. —	1 4-in. Q. 6 3-pr. Q.	4 12-pr. Q. —	2 4-7-in. Q. 4 12-pr. Q.	4 4-in. Q. —	2 4-in. Q. 5 12-pr. Q.
Torpedo Tubes	3 3-pr. Q.	2	3	2	2	2	2	3
Complement	18	45	35	67	72	178	150	123
Fuel Capacity	25 tons	60 tons	30 tons	100 tons	126 tons	250 tons	200 tons	160 tons

indicated by their name or that of "scout" must in any event largely depend upon the admiral to whose command such craft are attached; their functions must inevitably be dictated by considerations *in situ*.

One thing at least is certain: battleships, acknowledged to be the objective of the torpedo, will and must be provided with such an armament as shall counteract effectually the menace of destroyer or torpedo boat attack. The 3-in. 12-pr. Q. was introduced to destroy vessels with a displacement in the region of 300 tons or under. This gun has remained where it started except in the matter of muzzle-velocity, the boats these weapons were introduced to destroy having increased in size out of all knowledge.

No one would have dreamt of repelling the torpedo gunboats of ten years ago with projectiles of only 12 lb. in weight, and yet to-day these same projectiles are expected to protect the capital ship from attacks by boats considerably larger and infinitely faster, and hence more dangerous. The necessity for a small gun firing a large number of shots per minute is fast disappearing; this necessity arose through the small size of the mark to be fired at, for it was realised, and rightly, that in projectiles flung out upon a swiftly moving, scarcely visible object, the chances of obtaining a hit would be augmented in ratio to the number of such projectiles discharged. The inference is, of course, bad, for in correct theory one care-

DEVELOPMENT OF TORPEDO CRAFT 127

fully-aimed shot should more than value a score hastily fired; but in practice it had been found otherwise. But whichever reasoning be held to be correct, in neither case can the retention of the 12-pr. gun as an anti-torpedo boat weapon be sustained. A mere glance at the dimensions of the *Ghurka* and *Swift* is sufficient to support the theory that future safety must be sought in a very much increased calibre.

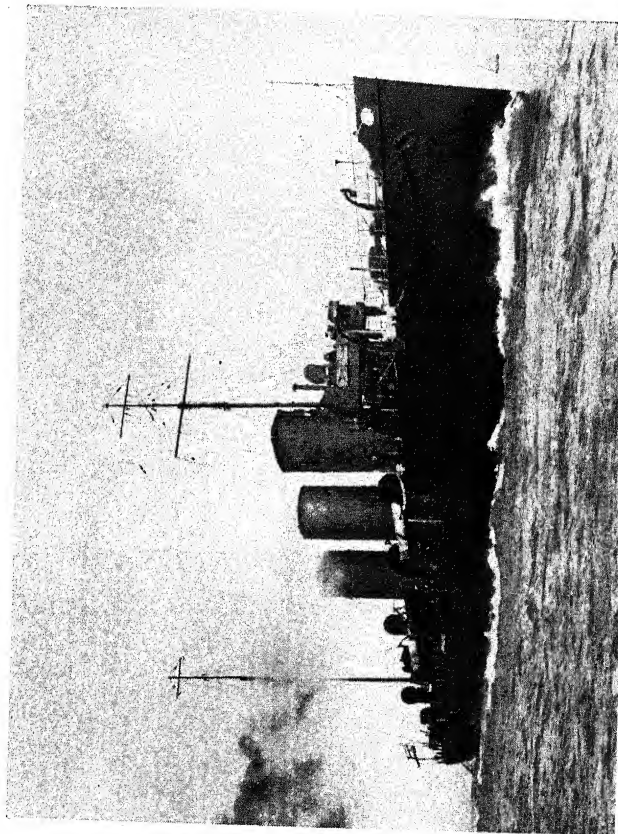
	<i>Ghurka</i>	<i>Swift</i>
Length . . .	255 ft.	345 ft.
Beam . . .	25 ft. 7 in.	34 ft. 2 in.
Draught . . .	8 ft. 10 in.	10 ft. 5 in.

Imagine, for instance, opening fire upon the *Arrogant*, a second-class cruiser of 5,750 tons, with a 3-in. 12-pr. Q. ! The idea is ludicrous, and yet this vessel is not so long as the *Swift* by 25 ft. ! And what effect could a 4-in. Q. have had upon the old battleship *Trafalgar* ? Obviously none, and yet she and the *Swift* are identical in length, and the latter shows rather more hull and thus (though but a sixth the displacement) appears a larger ship in side super-fices. The fact is, the resisting power of the modern destroyer has been much underrated, and the destructive power of the 3-pr. Q., 6-pr. Q., 12-pr. Q., and even the 4-in. weapon as much overrated, and the result of this discovery is to be seen in the influence it has borne upon the recently-launched warships of Germany, the United States, and Japan. In the war

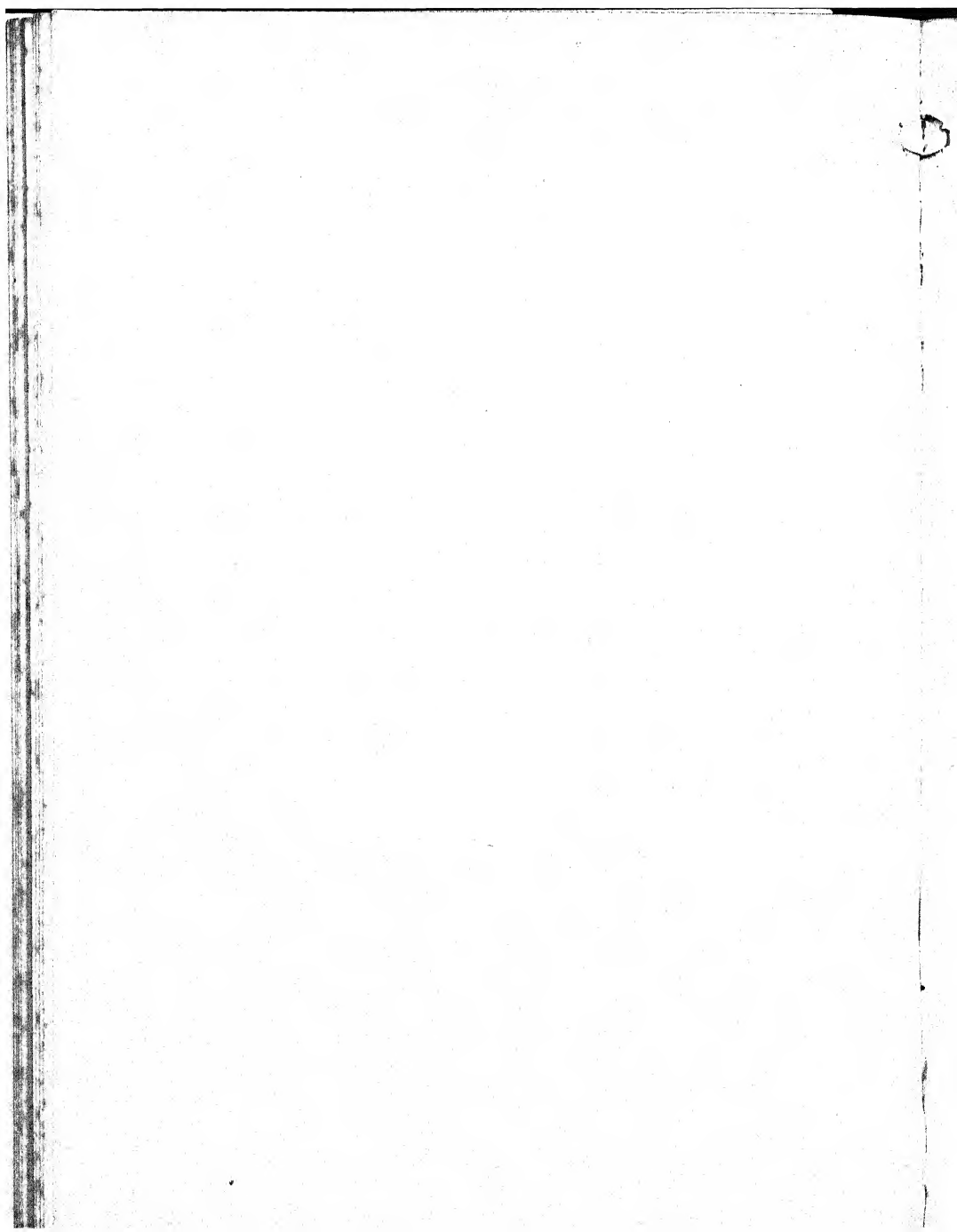
between Russia and Japan, the generally prevalent idea that a couple of 12-pounder shells would disable a destroyer or first-class torpedo boat, wherever burst, was on many occasions disproved; the most numerous engagements during the whole naval campaign were between the torpedo craft of the opposing nations, and the number of hits these small vessels could sustain without serious damage has been the subject of much wonderment ever since.

Accepting this, the advent of such vessels as the *Tribal*, *Swift*, and subsequent classes will necessitate a return to secondary batteries in warships before their prophesied abandonment has fully taken effect. The *Dreadnought* carried 12-pr. Q. only, the later ships mount a 4-in. gun; the American Michigans carry the 12-pr. Q.—the Delawares will have a 5-in. weapon. So with all the Powers is the truth being realised, and the 6-in. Q. or even larger will return,* not, however, as supporting the large guns of the main armament, but purely for defence against torpedo-carrying craft. The happy mean will be a gun firing a shell which, whilst of sufficient power to disable immediately any destroyer it strikes, shall also be of so reasonable a weight as to permit the discharge of many such projectiles in rapid succession and place the maximum responsibility for its operation upon manual power and the minimum upon mechanical.

* Since this was written, many battle-craft mounting the 6-in. gun have been laid down for the British Navy.—A. H. B.



Photograph by Stephen Cribb, Southsea
H.M. DESTROYER "SWIFT"



DEVELOPMENT OF TORPEDO CRAFT 129

As matters rest to-day, the outside weight for such a shell would appear to be 100 lb., and the 45-lb. shot of the 4.7-in. Q. is the least that can be counted upon as likely to prove effective against 1,000-ton destroyers.

As to the development of these vessels, a suggestive word may perhaps be permitted. We have turned another corner in speed increase with the advent of the turbine; this presages much higher velocities than that even of the *Swift*, and with speed will come weight and heavier armament. A 2,500-ton destroyer, steaming 40 to 45 knots, must declass all small vessels of 500 tons or less—at least as regards surface craft. The earlier types of destroyer and the latest torpedo boats will be then where the torpedo boats of twelve or fifteen years ago are now. Yet craft of this size will cost their quarter million—possibly double. Something of lesser price, lesser size, and yet fully effective must come into being. Mr. McKechnie, a well-known naval architect, suggested internal combustion engines for battleships; progress here there will be, and every decrease in engine weight for horse-power developed in this method of propulsion augments the possibilities of submersible craft. Perhaps, then, when speeds of 25 knots can be assured to these vessels for surface work, we may see a deck-protected submarine, with a battery of numerous torpedo tubes, associated with light, disappearing quick-fire guns, displacing, at

most, no more than do the largest ocean-going destroyers of to-day, and costing approximately the same to build. But upon these and kindred matters it is unwise to prophesy beyond discretion.

CHAPTER VII

ON THE CULT OF THE SUBMARINE

“FAMILIARITY breeds contempt.” On October 2nd, 1901, there was launched at the naval yard of Vickers and Son, Barrow, the first British submarine. Every paper portrayed this prodigious happening and commented (in manner variously contradictory) upon its portend. The obvious portend was writ large for all to devour—that at last the British peoples, after a graceful period of hesitancy which has ever distinguished our adoption of essential mechanical and civilising advances (to wit, the breechloader, screw-propeller, dirigible balloon, and many another), had recognised the initiative of a firm that had acquired a tested and reliable American design, the *Holland*. And what a ship No. 1 appeared to us—how perfect, how effective; above all, how full of promise!

There is something of the tortoise in the British character, and we seem to have ingrained in us the precious if hazardous aptitude of “getting there” in the end; historians, writing of our military campaigns, call it “muddling through.” Whatever it is (and I shrewdly suspect that much of the self-

depreciation in which, as a race, we so freely indulge, is largely a "pose"), the interest for the moment lies in this valuable consideration that to-day, twelve years after the portentous event chronicled above, we lead the world in submarines—in design, efficiency, size, war-value and knowledge of how to use them, which, being undoubtedly so, is all to the good. We have now some vessels coming forward sufficiently important to be given names—they merit more than the blunt alphabetic-numeral designation F10 or C32 to which we have become accustomed. Of these vessels insufficient information has been vouchsafed to write for certain, but we can take, say, the E type and parallel this beside the historical No. 1. Observe closely, I beg, the progress made before I draw a moral and point the proper path for future reflection :

	No. 1	No. 2
Launched	1901	1911
Length	63 ft. 4 in.	176 ft.
Beam	11 ft. 9 in.	22 ft. 6 in.
Light Displacement . .	104 tons	700 tons
Submerged Displacement .	120 tons	812 tons
Surface Engine Power . .	160 I.H.P.	1,950 I.H.P.
Surface Speed . . .	10 knots	17 knots
Submerged Speed . . .	7 knots	10 knots
Armament { Guns	Nil	2
{ Torpedo Tubes . .	1 18-in.	4 21-in.
Cost, Round Figure . . .	£35,000	£95,000

Did ever ten years show in the passage of its time so marvellous an evolution ? I doubt it—whatsoever the subject or object. The submarine has, as a public

curiosity, passed through its many phases; its romance has been extolled, its mystery exaggerated, its potentialities in full measure confused, its war-value and purposes almost studiously ignored. Here I would rather discuss its military bearing in regard to its present state of development, and its possibilities as foreshadowed by the constant and traceable evolution evidenced in each succeeding type. It has a bearing for us from a dual standpoint—the defensive and the offensive. These I shall set out quite shortly, and they cast some light on the popularity it has obtained with all nations and the paradoxical reasons controlling its almost universal adoption—for is it not remarkable that the value placed upon these craft by us, Mistress of the Seas, finds its counterpart in the reasons that led to their adoption by Peru and Holland?

Taking it as it appeared to the world at large in its earliest practical conception, it need hardly be said that the submarine was (according to the quid-nuncs) to sound the death-knell of the battleship. The battleship compares favourably with the phoenix—it rises after the introduction of each new invention from the fires of ill-considered criticism and (subsequent to such invention reaching its proper and fore-ordained sphere) pursues its way unscathed as the final arbiter of sea warfare. So confident does precedent in this matter make me, that I have yet to be convinced that the aerial menace (a real menace

in an untried element) will do more than modify the design of battleships to meet the new conditions. The great siege of Gibraltar, with the red-hot shot it popularised, was cited in those days as indicative of finality to ships-of-the-line; the disaster from a similar cause to the Turkish Navy in the early nineteenth century led to the same erroneous conclusions. More recently the torpedo and now the airship have sounded the crack o' doom on the steel leviathan of the battle front. Dismiss them all, for the battleship will have its place in some form or other until the end.

Let us see now what a submarine is, or can become. Surely it differs little except in detail and externals from the usual conception of warships—i.e. a floating means of conveying destructive forces into contact with the enemy. All warships in their various classes are compromises on certain accepted points. To be effective the perfect battle-unit must possess the maximum of obtainable efficiency at a given date in (a) offensive power, (b) defensive power, (c) mobility, (d) seaworthiness, (e) reliability, (f) tactical and strategical value. The battleship, as we understand it, forgoes something of speed to extend its value in the other desiderata; the armoured-cruiser (or battle-cruiser) reduces the defensive factor to the advantage of mobility; the destroyer demands high velocity at the expense of reliability and protection. The submarine introduces

a new feature—the power of “hiding,” the attribute of temporary invisibility.

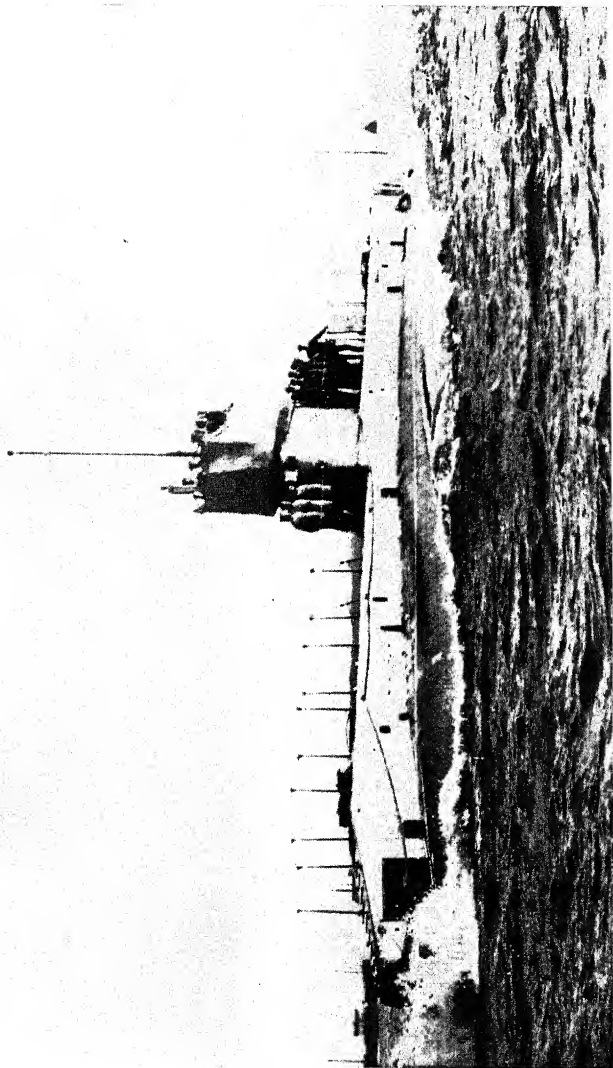
The submarine, by very reason of this unique advantage, can compromise to a greater extent than surface vessels in those matters more or less essential to them; for the submarine introduces in direct fashion human and mental considerations. Indeed, the submarine is a paradox in this, that, owing to the moral effect created in the minds of a personnel knowing that their opponents possess these elusive craft (though where Heaven only knows!), it can sway decisions or movements without ever putting in an appearance!

'Tis the embodiment of naval suspicion is the submarine. It is the “often suspected” but the “seldom seen,” or, to put it yet another way, the “frequently seen” (in imagination) but “seldom there.” Perhaps it is this side of its work, inseparably bound up with the power of submergence, that has surrounded it with so much mystery and romance. Be that as it may, no naval commander will dare ignore, except at great risk, the chances and fears such a power provides. Yet the submarine, as shall be proven, has abundant limitations.

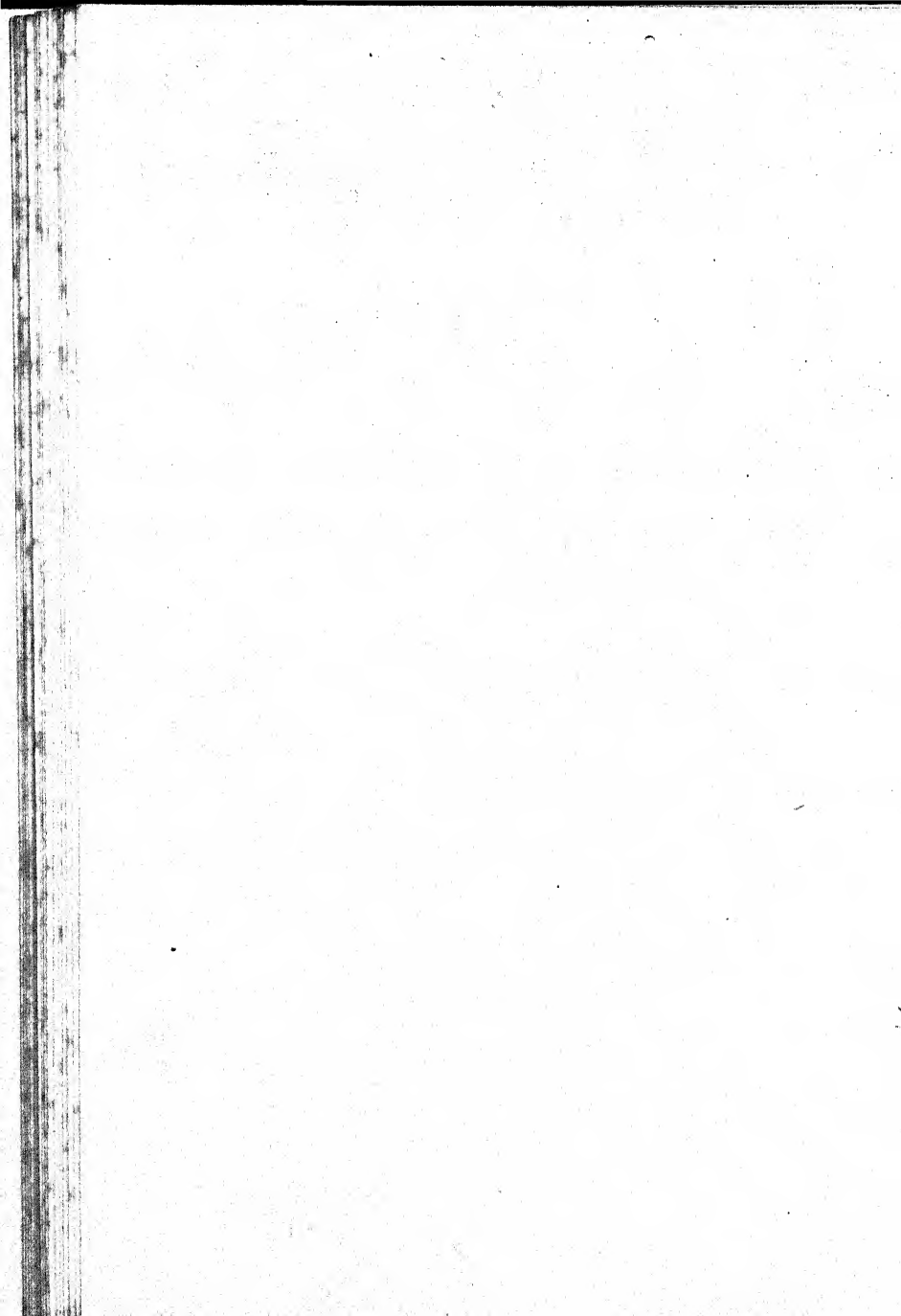
The British Empire rests on its Navy; its Navy finds its strength in the battle-line—the heavy brigade. What more natural than that, having foreshadowed the possibilities of its development as a moral (and practical) factor in sea wars, jealous

rivals should see in it not only the doom of the battleship but also the waning power of our naval supremacy? The argument is notable for its bland simplicity; thus, the battleship is defenceless against the torpedo, and the submarine can torpedo the battleship without being sighted. Therefore the trident *must* be torn from our grasp by the nation courageously attacking us with an adequate number of subaqueous craft. The problem presented is scarcely worthy of reasoned argument; but if it applies to battleships, it applies equally to all surface craft. The *impasse* created by the construction of an enormous number of submarines by *all* the Powers, each intent on the same fell purpose, beggars description! Think of an Armageddon upon these lines—all the nations of the world engaged and each concentrating their submarine forces upon the destruction of hostile surface ships. First, all the battleships would be destroyed; with them gone, the armoured and protected cruisers would assume premier place; they in their turn would, presumably, be sunk, and after them destroyers, merchant ships, colliers and the rest. By a process of elimination we should arrive at a condition of things where submarines alone swept through the seas! Surely this is a theme worthy of some great novelist. But it could never happen.

Invention never works this way; invention is a series of strokes and counterstrokes; no cock-of-



H.M. SUBMARINE "E 4"



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the-walk in lethal weapons has ever lasted long. Indeed, in every case before development has reached its highest point some new turn is given by the wheel of Fate, and, in a flash, the masterpiece of the past has become the commonplace of the present, a commonplace well on its way to burial in the records of historical progress. So with the submarine—from a creature of possibilities untold it has dropped into line with the torpedo (its chiefest weapon), the turbine, the high-explosive shell, and the rest. In one thing only does it (and will it) remain supreme—in the power of its moral effect. Thus the battleship rules as the “arbiter,” the cruiser as the “chaser,” the destroyer as the “smasher” (if lucky), and the submarine as the “frightener.” To which shall we give the palm?

The submarine has been called the “weapon of the weaker Power,” and to some extent there is truth in this. But all the same, it is a vital adjunct to the naval forces of the very strongest. Taking the first point, I have mentioned that Peru has submarines; she has two very effective Laubeuf type, the *Ferré* and *Palacios*, of 458 tons displacement when submerged, with a surface speed of 15 knots and carrying five torpedoes. Now, though Peru could never maintain a large fleet, she might have her national *amour propre* injured quite as deeply as a nation that did and could afford this luxury. The retort discourteous (to carry the story on) might lead to battleships

of the aggressor appearing off, say, Callao. The two submarines could not effect the final outcome of an encounter between Peru and a larger nation owning battleships, but their very presence would incite a certain respect which in its turn might conceivably lead to a settlement more consonant with Peruvian dignity than would be the case did these vessels not exist. The point does not require labouring. Thus far the small Powers—and Peru, in her penchant for submarines, is in the excellent company of Norway, Sweden, Holland, Portugal, Denmark, Greece, Argentina, Brazil, Chili, etc., to mention a batch of the lesser nations of the world.

To indicate the value of the submarine to the mightier nationalities, and thus disprove the contention that it has been developed to our detriment, I must perforce imagine ourselves *vis-à-vis* our Teuton neighbours across the sea. In this consideration the defensive and offensive issues become inextricably mixed—though the more recent decision in this country to build two distinctive types of submarine for different purposes tends to clear matters up.

What have we to fear from Germany as a supposititious foe? Frankly, on this point I am not quite clear. Some tell me it is invasion under cover of a fog; others that we shall be raided after our fleet has been decoyed (in times of perfect peace and on an errand of fictitious lunacy) to the Cape of Good

Hope. This is the military fear—or somewhere near it. The naval-minded critic fearful of his country's welfare sees our coming doom in the growing battle-fleet of Germany; others of his kidney fear for our fighting-line as they conjure up visions of shoals of submarines torpedoing our ships as they lie strung out at Spithead, in review order. All rather exaggerated, it is true, but, even so, subsisting on a good substratum of solid possibilities. The Germans have a magnificent army, a fine fleet, an efficient personnel and great national stamina, natural courage and military ability. These they would, and will, put to the very best uses should ever they be called upon to decide a vital question in the awful arbitrament of war. Let us deal with the fears and the flutterings—they do credit to our imaginations and lend an incentive to the study of naval and military problems.

As to invasions or raids—no man dare say that a raid is not possible, even probable. Which being so, does not the known presence of scores of effective submarines along our Eastern shores tend, with every addition to their number, to make any such raid the more hazardous? Assuredly so—even more hazardous than the certain knowledge that decoying fleets away from points of obvious danger belongs to the days prior to wireless telegraphy. Yet it is we, the mightiest sea-power (and the laughing stock of the world as a military power until we bask in the safety of universal national service) that will stand to gain

more and more in so far as sudden attacks on our coasts are concerned with every development of the submarine. This, then, is the value of the submarine to us from the defensive standpoint; but it is also to have an offensive rôle, and to meet this purpose there will shortly come a division in submarine types as sharp and precise as that which formerly distinguished the high-sea battleship from the coastal-defence monitor. The offensive rôle requires certain features in design not essential in defensive work, or, at the least, not to the same degree. To begin with, they must be able to go anywhere in any weather, and remain away from a base for long periods on end; this speaks of high tonnage. What will the sea-going submarine do in future naval wars? Here we can only conjecture, but we know that one part of their work will be to act as "ferret" against any battle-fleet refusing to leave the shelter of a harbour or the protection of a fortified base. Of their possible work during a fleet-action it is impossible to write with certainty; all these things will much depend upon the lines of progress they follow in design.

We deduce this, though; that from now onwards the submarine will develop in a dual form, each entirely distinct from the other in purpose, and tending as years advance towards wider and yet wider divergence. Even at this very moment we are building the smaller defensive craft; the type is under

way, and in its displacement is much less than the submarines to which we have become accustomed. This type will remain comparatively small and comparatively slow—it will progress, however, in general effectiveness. For the other type, the sea-going, we may anticipate a wider future. It will slowly take on more and more the attributes of the surface ship until (who knows!) it may in time merge with it and represent in its various phases the battleship, scout and destroyer of the future! Armour protection will assuredly be applied in increasing thickness, speed is rising in leaps and bounds, habitability is a vital consideration receiving marked attention, safety is already a feature of certainty, armament is a changing factor tending ever to promote higher fighting value.

All this has come very suddenly. The application of under-water attack to warfare is almost as old as the early phantasies of aerial flight. Alexander the Great, in his siege of Tyre, surprised the fighting men of nearly four centuries B.C. by his use of the diving bell; Bohaddin, a knowledgable man of Arabia, stated, in the early years of the Christian era, that attacks were made against Ptolemais under water. Not a century has passed that has not held many an account of attempted development and of idea tending towards the practicability shown to-day, and yet, in spite of all, the effective value of the submarine up to twenty years ago had advanced nothing

since the days of Aristotle. It is in these last twenty years that the jump is seen, the leap from ingenious idealism to real effectiveness. A short extract here is quite interesting ; it is from an article by Admiral FitzGerald that appeared in the February issue of the *Empire Review* in 1901 :

“ There is one engine of destruction—or, rather, proposed engine of destruction—concerning which I desire to make a few remarks, and that is the submarine boat. Personally, I do not believe in the submarine boat *at present* as a serious factor in naval warfare. That, however, is a very small matter, as a great many people do believe in her, and both the French and Americans are building several. There seems to be an insuperable difficulty in the matter of securing stability, and especially longitudinal stability, in a totally immersed body. It is said that the weight of one man moving forward or aft in a submarine boat completely deranges the longitudinal stability, and thus, of course, causes her to steer erratically in the vertical direction, which would be very awkward if she were near the top and did not want to appear, or near the bottom and did not want to stick in the mud. But who shall say that science and French and American ingenuity will not overcome this apparently insuperable difficulty, and bring us face to face with a most formidable engine of naval warfare, of which we shall have none ? ”

Though much of this reads very curiously to-day,

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we can pay tribute to the prophetic attitude of the gallant author of the above sentences. Think, then—in 1901 we were doubtful of the practicability of the submarine; to-day the appended table of possessions in these craft, built and building, is full of interest:

British Empire . . .	99	Denmark . . .	7
France . . .	92	Brazil . . .	6
U.S.A. . . .	47	Norway . . .	5
Russia	37	Portugal . . .	4
Germany	36	Greece	3
Italy	20	Chili	2
Austria-Hungary . .	15	Peru	2
Japan	15	Argentina . . .	1
Sweden	9	Spain	1
Holland	8		

Showing a grand total of 409—built at the average rate of some twenty-seven a year! One curious fact is worth noting—there is no definitiveness of design or approximate acceptance of type. And so though, as a unit, the submarine is a vital factor in present-day naval considerations, no unbiased man will lay down for certain whose specific design holds premier place. Nations are sampling the genius of one another—perhaps guile enters a little into this arrangement! For instance, in providing submarine flotillas, Great Britain has aided Japan and Australia; Germany has aided Austria, Italy, Norway and Russia; France has aided Great Britain, Brazil, Denmark, Portugal, and Sweden; America has aided Great Britain, Japan, Argentina, Austria and Chili; Austria has aided Denmark.

What an interchange of ideas! By this process of sampling we shall at last reach a comparative definiteness of type, no doubt; in the meantime, the satisfaction is ours that the latest design now under construction at Barrow gives place to none in war-value and general fighting efficiency. Yet we are no longer the only nation setting a pace. Our submarines are round about 1,000 tons in displacement, the French *Gustave Zédé* (what a master brain in submarine development she brings to mind!) is near the same, the German U21 is of 850 tons, so, too, are the latest Russian and American. When will it all end—and where? Are we really at last approaching the time when machinery-made war will, in its promotion, lie vested in the navigation of single elements? Is it to be the submarine below the surface of the waters and the airship above the reach of the highest wave-crest? Who shall dare say “Yea” or “Nay” he would be, indeed, a brave and dashing prophet!

CHAPTER VIII

ON THE GENESIS OF WAR-SHIP PROTECTION

Who it was that first proposed the shielding of ships of war by walls or vertical defences against the projectiles of an enemy, it is quite impossible to say. It is, however, safe to conjecture that such protection, rudimentary though it may have been, made its appearance with the launching of the first ship intended to engage in hostile combat. So far back we cannot go, and must perforce be content with the teachings of known history, limited though they be.

Introduction of Sheathing.—Though scarcely bearing upon the subject on hand, it is of interest to note that the Homeric vessels of the classics were, according to Theodosius, small, unseaworthy, open boats and never used for voyages beyond the sight of land. It is to the unseaworthiness of these earliest craft that sheathing owes its discovery. The value of sheathing against the effects of the sea was thus forced into recognition, and we are told that the famous galley of Trojan, described at some length in

a well-known work on navigation,* was covered on the outside with sheets of lead nailed to the planks with copper nails. Strange as it may seem, it was not until fifteen hundred years had elapsed that sheathing made its appearance on British war-vessels.†

Menace of Fire.—We know again how it was the custom of certain maritime nations to line the sides of their ships with the shields of the fighting men, and these rows of shields became even more scientifically utilised at the appearance of fire and burning arrows and spears, as factors to be dealt with in naval combat. It is unnecessary to follow in detail the close connection of the various classes of fighting ships from age to age; as at the present day each new vessel was a progressive step in advance of its predecessor, each innovation marked the obsolescence of a former type. Up to the twelfth century no protection other than that provided by the bulwarks is to be found, the probable reason of this being that until then wood had proved effectual as a defence, and when the artillery increased in power it was a simple matter to add a further layer of oaken planks. The naval architects of those times were doing precisely what was done on the introduction of iron plating, increasing the thickness as required. And just as in course of time no increase

* "History of Navigation," John Locke.

† In 1673 an order was issued from the Admiralty directing that certain ships of the Navy should be sheathed with lead.

of timber availed for protection against shell fire, and thus necessitated the adoption of iron, so eventually did breech-loading guns gain the mastery over iron and necessitate a still further change to the hardened steel with which the modern man-of-war is armoured. How true is it that nothing new exists beneath the sun—evolution is the basis of all change.

The First Armoured Ship.—It was the Normans, then, who first applied a metal protection to their ships. Curiously enough, the object of this armour was to defend the vessel against assaults by the ram. For, according to "*Archéologie Navale*," this protection took the form of an iron band completely encircling the vessel and terminating at the forward end in a sharp ram. This band was fixed on a level with the water-line, and its surface was continued upwards by overlapping shields placed in the manner already referred to. Obviously, these hardy sailors were not alone in their use of the ram, and it is but reasonable to suppose that the belt of iron was affixed for the sole purpose of warding off charges of hostile craft.

1354.—Leather Sheathing.—Another century passed ere we again hear of attempts at armouring. In 1354, Peter of Aragon, struck by the damage occasioned in naval combats by fire, ordered that certain ships should be given a complete sheathing of leather; the idea was ingenious, and, taking into

consideration the weapons in use at that time, probably quite efficacious. Yet it was not followed up, and for nearly two hundred years no further methods of defence were tried.

1530.—*Santa-Anna*.—Then in 1530 came the famous carack *Santa-Anna*. This carack was built at Nice and added to the expedition against Tunis organised by Charles V. It was a present from the Chevaliers of St. John of Jerusalem, and in the history of these gallant Knights written by Bosnio, we find a short description, of which the following is a translation:

“She had four decks (?) out of water and two in the water cased with lead, and the stoppers of bronze which does not harm the lead like iron, and which clamp so firmly that the combined cannons of an army will not be able to sink it. . . .” *

This remarkable vessel was under the command of Andria Doria,† and contributed greatly to the eventual success of the expedition.

1571.—**Battle of Lepanto**.—At the battle of Lepanto in 1571, the Catholic ships were protected

* “*Elle avoit quatre couvertes hors de l'eau et deux dans l'eau revestues de plomb, et les bouchons de bronze qui ne gastaient point le plomb comme le fer et qui s'appliquoient si proprement que les canons de toute une armée ne l'eussent sçeu mettre a fond*” “*Couvertes*” here probably means “strakes”; the vessel was clinker-built according to some authorities.

† Andria Doria did not actually command the *Santa-Anna*; he commanded the entire fleet.

by fitting upright beams inside the decks some distance from the outer hull ; these beams were then boarded up and the space between them and the hull filled in with old sails, cords or any resistant rubbish that could be found.

1782.—**Batteries of d'Arcon.**—Another two centuries passed before we again come across attempts at protection, and this time it proved a most complete failure. The author of the plans was a Frenchman, Chevalier d'Arcon ; the inability to take Gibraltar after a two years' siege, stimulated the French and Spanish nations to make one final and desperate effort. To this end, all ideas that seemed in any way likely to be conducive to a happy result were eagerly seized on, and the plans of the Chevalier were among them. He proposed a series of ten floating batteries,* roofed in with a thick turtle-back cover ; on one side, that intended to face the enemy, it was to be no less than 5 ft. 11 ins. in thickness, and composed of the hardest possible wood reinforced by layers of leather and cork and bound together by iron bars. As an additional protection against the red-hot cannon balls which the plucky garrison was so generous in distributing to their besiegers, the inventor arranged that water should be kept constantly flowing between the various layers, thus ensuring complete humidity.

On September 13th, 1782, Admiral Moreno placed

* Their displacement varied between 600 and 1,200 tons.

the new additions to his heterogeneous force in position, anchoring them close under the guns of the huge fortress, and just exactly where the British would have wished them placed.

They then opened fire with their 212 guns, and for several hours undoubtedly did a lot of damage owing to the closeness of the range; the English shot failed to penetrate the thick carapace, and for a time it seemed as though their purpose was likely to be accomplished. Then the defenders began to fire red-hot shot, and to the horror of the French and Spanish the water-system refused to act, and before half an hour had elapsed, fires broke out on board all ten of them. Shortly after, five of their number blew up, and the remainder, after burning to the water-line, were run ashore or sank.* Thus the attempt proved a dire failure, though the blame for it scarcely attaches to either the inventor or the French; though unlikely to have in any way affected the history of Gibraltar, the disaster might conceivably have been lessened had the Spanish admiral shown a more judicious choice in the positions he ordered these novel craft to assume. Carried away by his belief in their invincibility, Moreno placed them where, even had the water circulated as designed, it is certain they must eventually have succumbed to the plunging fire of the batteries above them.

* Out of the 5,260 men forming their crews, only 487 were saved, and these mostly wounded.

1814—*Fulton's Demologos*.—Thirty years more bring us to the time of Fulton's first protected battery. The *Demologos*, as he named it, was laid down in June, 1814, and launched in the month of October following. The original intention had been to get it commissioned within nine months, and thus give it an opportunity of testing its powers against the British vessels blockading the Hudson. Unfortunately, the construction of the engine disclosed many defects, and it was with much difficulty that it could be made to work; eventually, however, after nearly a year of delays, the *Demologos*, or *Fulton*, as it was re-christened, on the death of its inventor (February 24th, 1815), was commissioned in September, 1815, too late to be of service to its owners, peace having been already declared. This, the first steam war-vessel in the world, had a length of 156 ft., and was of very peculiar construction. The hull was double, a channel about 15 ft. in width, dividing the two sections; in this channel worked the single paddle wheel, and with it an average speed of 5.1 knots was obtained on a double journey between New York and the mouth of the Hudson. The battery, which contained 30 cannon, throwing a shot of 32 lb., was protected by a wall of wood 5 ft. in thickness from the upper deck, to 3 ft. below the water line. The *Fulton* blew up as the result of an accident in 1829, and a second of similar type, christened *Fulton II.*, was constructed, and to the thick wooden defence

of the first vessel was added a thin sheet of iron, the first iron armoured ship to go afloat.

1826—1844.—In 1826, a French nobleman, who preferred anonymity behind the initials D.L.F., proposed the construction of iron frigates with a belt of the same material capable of withstanding any gun of the day.*

Further than the mere statement of his idea he did not go, and such being the case he can receive no credit as an inventor. Of similar type were the proposals of Admiral de Missiessy, who, three years later, asked the Ministry to lay down three armour plated prahms; he did not, however, give them any idea as to form or design.†

M. Grenier, an artillery captain, came next with plans of armour plating, but a council sitting at the time (1831) to examine the question on behalf of the Ministry of Marine rejected them as impracticable. Four years later, Mr. J. Podd Drake proposed the protection of war-ship engines by iron plates $4\frac{1}{2}$ in. thick,‡ and in 1841 Robert L. Stevens designed his armoured battery, which was laid down at Hoboken fourteen years afterwards, and, having

* In a little brochure he published, he wrote "*Lorsque l'ennemi aura adopté l'emploi des canons à bombes, les bâtiments en bois ne serviront plus pour guerre.*"

† "*Aperçus sur le matériel et le personnel de la Marine,*" Admiral de Missiessy, 1829.

‡ Admiral Fishbourne before "The Royal United Service Institution."

cost 700,000 dollars, subsequently broken up without ever leaving the stocks.*

It will be seen that no definite result had as yet been arrived at, but the increased attention that the subject of armour plating received from all quarters induced the authorities in both France and England to institute a series of experiments in order to determine whether or not vessels so protected possessed any real advantage over others.

Whilst, therefore, the British authorities were splintering innumerable iron targets at Woolwich, the French were making similar experiments at Gâvres. These were but a continuation of similar trials carried out in 1834 at Metz, at the instigation of General Paixhans, subsequent to which the general had proposed (and been derided for the proposition) to add iron plates to the sides of all the French line-of-battle ships. They began by testing the value of coal as a defence against shot, and proceeded to try the resisting power of single plates of iron of from 12 to 5 millimetres. From these trials they went further, and placed several plates together; from this it was found that 12 plates of 12 millimetres each would stop a shot from a 30 calibre 32-pounder gun at a speed of 450 metres, while at

* Congress voted 500,000 dollars for its construction and afterwards a further 200,000 dollars; as it still required 500,000 dollars to be completed, it was allowed to remain unfinished until broken up.

378 metres nine similar plates were pierced with comparative ease.

In 1844 the experiments were continued under the presidency of the Prince de Joinville, and there is little doubt that the designs of the *Gloire* were the eventual outcome of these experiments. It is interesting to note that whilst in England, after the first few trials, all ideas of armouring with iron plates were given up, in France the experiments went on uninterruptedly; the French engineers and artillery experts could see the future value of their labours, and persisted in them in spite of the paucity of immediate results.

1845.—**Dupuy de Lôme.**—In 1845 we hear of the first design for a sea-going ironclad, and it is in the right order of things that the author thereof should in the end have been the designer of the first ironclad to go to sea. Dupuy de Lôme has long ago secured his niche in the Temple of Fame, but at the time he proposed his armour-plated frigate he was comparatively little known even in France itself. He wrote of this first design: "Sails should not be other than an auxiliary motive power; we must try and place on board ships the most powerful steam engine possible, always bearing in mind the other indispensable conditions of the problem One is led to seek a more complete method of protecting the engines by walls impenetrable to the projectiles of an enemy."

The following few particulars of this proposed frigate are highly interesting :

Displacement	.	.	.	.	2,366 tons*
Length	.	.	.	.	68 m. 30 (224 ft. 1 in.)
Maximum draught	.	.	.	.	5 m. 90 (19 ft. 4 in.)
Nominal horse-power	.	.	.	.	600
Speed	.	.	.	.	11 knots

Protection was to be afforded by six sheets of iron 15 mm. in thickness riveted together and placed direct on to the hull itself. He rejected the idea of defending a vessel by means of thick layers of wood as altogether useless, and decided for iron. Advances in the manufacture of metal plates convinced him that by their use the weight of the hull of French war-ships in relation to their total displacement might quite easily be reduced from 42 per cent. to 23 per cent. ; the 19 per cent. thus saved he proposed devoting solely to the protection of the hull at the water-line, and argued that with a belt 2 m. 40 (7 ft. 10 in.) in depth, and extending all around the water-line, he could provide a thickness of 166 mm., or with the hull itself, 177 mm. But this thickness he considered too great, and therefore carried his proposition further ; by reducing the plates he would have sufficient reserve of buoyancy to armour a portion or even the whole of the battery. That he might obtain these results he even desired to sacrifice some of the guns, his contention being that a wooden

* Metric tons.

ship, however heavily armed, could not hope to engage a vessel armoured as he proposed with any chance of success. Finally, he asked his Government to institute further experiments on the resistance of metal armour.

It will be seen from the above that the talented engineer was not only very much alive to the possibilities of the armoured vessel, but, with the enthusiasm of an expert, believed thoroughly in the future of that type of vessel. It is to be regretted that his plans were not put into execution, for undoubtedly they embodied many novelties, and in all probability differed but little from the designs he subsequently formulated. The reason why these ideas were not immediately followed up must be sought not in France, but in England.

Experiments at Woolwich.—The experiments at Gâvres (and before these, at Metz) had opened the eyes of the British Admiralty to the exigencies of the case; and a committee having been hurriedly summoned, a prolonged series of experiments was undertaken at Woolwich. They began by firing at a target 6 in. in thickness, and made up of no fewer than fourteen separate iron sheets. A backing of 2 ft. of oak was added. The distance fixed between target and gun varied from 375 to 400 yards; the weapon used was an 8-in. muzzle-loader discharging a shot weighing 32 lb., and a total of 22 projectiles was fired, all with full service charges. The target

was practically destroyed in the first eight hits, yet not one was found to have penetrated into the backing. Though this proved the resistant capabilities of the iron, the authorities judged the result unsatisfactory, for on examination it was discovered that the whole fourteen plates had become practically disintegrated by the repeated concussions.

1846.—Further Experiments in England.—When, in 1846, these experiments were repeated on a larger scale, it was found that, besides undergoing a process of disintegration, the metal splinters caused by the piercing of iron plates flew about in a fashion that on board ship would render any proximity to a breached plate highly dangerous. Also, according to the experts, a hole once made in the hull of an iron ship would be a continual source of danger, especially if near the water-line, owing to the difficulty that would be experienced in blocking it up. In the case of wood, the shot having passed through, the texture closed up the aperture of its own accord; and should water get in, it merely tended to swell the sides of the hole and render plugging a very simple matter.

, In view of all these difficulties, and, as they were considered then, insurmountable disadvantages, the Admiralty again gave up all idea of iron hulls for war-ships or armour plating for those built of wood. This decision of course reached the ears of those at the head of affairs in France, and placed them in a

frame of mind scarcely favourable to the success of new inventions. In those days, it is well to remember, the foreign naval Powers were apt to accept any decision of the British Admiralty relative to naval matters without demur, feeling convinced that the nation claiming the empire of the seas would scarcely condemn an innovation likely to add to her maritime power without being fully assured of its lack of utility.

Armoured Batteries.—Thus, for all the good they did, the carefully conceived plans of Dupuy de Lôme might as well have remained hidden in the master mind that gave them birth; yet, that they set men thinking is an acknowledged fact; and though no design of real value made its appearance until Dupuy de Lôme himself again stepped to the front in 1857, nevertheless we come across several ideas for armoured batteries possessing many points of absorbing interest. Before referring to these more fully it would be well to point out very clearly the relation of these curious craft to the history of the ironclad. Many historians are apt to give the designers of the *Devastation* and her four sisters the credit of the first ironclad. Our contention is that the *Santa-Anna* was more an armoured sea-going ship than any of these early, shapeless, unseaworthy batteries, and that if credit is to be given for the invention of the ironclad, it is due to the man who designed the first vessel bearing armour capable of

undertaking sea voyages—indeed, a sea-going ship; and the batteries of Kinburn were not sea-going ships or anything near it. In the *Gloire* we have the first ironclad line-of-battle ship, and it is well to remember this when we describe the floating armour-plated forts constructed during the period prior to her launch.

1847.—**Battery of M. Gervaise.**—At this epoch, we are told, the officers of the different branches of the French Navy gave their minds seriously to the study of protection, if not for line-of-battle ships, at least for those destined to engage forts on land.* In response to a Ministerial dispatch of December 9th, 1846, calling for designs for a screw coast-defence vessel, Engineer Gervaise proposed an armoured battery constructed completely of iron. He based his plans on the results of the trials at Gâvres, and further, with considerable daring, proposed a ram as an additional means of offence. The maximum draught was to be 15 ft. 3 in., and the speed, with 580 nominal h.p., 11 knots. The belt, extending from the bottom of the battery to 5 ft. below the water-line, was to consist of plates in three layers kept apart by Z supports, and having a total thickness of 6 in. The battery itself was to be covered with armour 4 in. in thickness. The armament arranged would consist of thirty 22-centimetre guns of 32 calibres. This design was most favourably received, but, unfortun-

* "*La Marine Cuirassée*," M. P. Dislere.

ately, the decision of the British Admiralty the preceding year made the Ministry very sceptical of the value of iron as a material in ship construction; furthermore, they doubted the ability of iron to withstand the effect of the constituents of sea-water after a voyage or two, and these objections having been thoroughly weighed and considered, the matter was allowed to drop. Gervaise's battery was never built.

1854.—**Experiments in Vincennes.**—The repeated refusal of the carefully thought-out plans seemed for the time to dishearten the enthusiasts of the cause, and we do not hear of any other real attempts to solve the problem until Engineer Guyesse was entrusted with the designing of the Devastation class. The Turkish disaster at Sinope* and the opening of the war with Russia materially advanced the study of the question, and experiments were conducted at Vincennes to decide finally whether or not armour should be employed as a defence, especially against shell fire, in the potency of which the Russians had given the world so sanguinary a lesson. Sinope had enforced the necessity of defen-

* On November 30th, 1854, a Russian fleet under Admiral Nachimoff, consisting of the *Tri Sviatitelia* and *Rostislav* (120 guns), *Imperitza Marie*, *Paris*, and *Tchesme* (80 guns), and *Grand Duke Constantine* (60 guns), attacked a Turkish force of seven frigates, two corvettes, and two small steamers before Sinope. The Russians fired shell, and within half an hour all except one small steamer had been set on fire and destroyed, the whole Turkish force being completely annihilated. The loss to the Russians was 34 killed and 230 wounded.

sive powers in ships upon the naval authorities of the whole of Europe, and Napoleon III., who deserves some credit for his share in the sanctioning of the armoured batteries, gave as his reasons for adopting them the great cost of regular ships of war as compared with the cost of the fortifications attached, and the magnitude of the losses to be feared in such operations if undertaken by large ships.*

There were but two methods in which the difficulty could be met: one by applying armour to ships' sides, and the other by building a large number of small vessels carrying each one gun: in the latter case, the loss of two or three would be of small account.

The Kinburn Batteries.—It was during the Vincennes experiments that one thick solid plate was found superior to a number of superimposed sheets of lesser thickness, and the value of a mattress of wood at the back also became manifest. So pleased were the authorities with the results attained, that M. Guiyesse, a naval engineer, and M. Garnier, Inspector-General of Naval Engineering, collaborated to design an armoured battery. Having decided on the main features, Guiyesse set to work on the plans, and so quickly and satisfactorily did he bring them to completion, that on July 28th, 1854, the order was given for the immediate construction of ten. Shortly afterwards, recognising

* "Naval Development of the Century," Sir N. Barnaby, K.C.B.

that it was merely an experiment, and therefore safer to begin in a small way, the Minister of Marine reduced the number to five.

These batteries were named the *Devastation*, *Tonnante*, *Foudroyante*, *Lave*, and *Congreve*; they had the following dimensions:

Length	52 m. 35 (171 ft. 9 in.)
Beam	13 m. 14 (43 ft. 1 in.)
Draught maximum	2 m. 65 (8 ft. 8 in.)
Displacement	1,651 tons
Nominal Horse-power	225
Actual I.H.P.	317
Speed	3·7 knots
Cost	£49,200

The defence consisted of an armour belt 110 mm.* in thickness, extending from just below the water-line to above the sea battery, which was only 90 centimetres (35·434 inches) above the sea. The armament consisted of sixteen large smooth-bores in the battery, and two smaller cannon on the forecastle. The construction of the engines and boilers was entrusted to the Creuzot Company, which in conjunction with the Schneider Company at Rive-de-Gier also manufactured the plates for the armour belt. These plates cost £3 17s. 6d. per 100 kilogrammes, though for bending the plates and boring them a slight additional charge was made. These plates were laid on a wooden mattress of exactly four times their own thickness, namely 44 centimetres (17·323 in.).

* 4·3308 inches.

The price of the boilers and engines was £5,660, and the latter made 112 revolutions at full speed. The propeller was four bladed. The construction of the vessels was hurried on, and the *Tonnante* was the first to take the water at Cherbourg (where all were built) in March, 1855. The *Devastation* followed on April 4th of the same year, and the remaining three were launched shortly afterwards. Yet though they were put afloat with nearly every fitting in place, the novelty of the design caused many unforeseen difficulties to arise, and it was not until August that three of them were able to leave for the Baltic in the tow of paddle steamers. Some doubts had been expressed as to their stability and seaworthiness, and their opponents were astonished to learn that both were excellent. Nevertheless they steered very badly, but this, when the low speed and bluff form of hull are taken into consideration, was scarcely to be wondered at.

At the end of December they anchored in Streleska Bay, and on October 7th left with the Allied Fleets for Kinburn. They were commanded by the following officers:—*Devastation*, Captain de Montaignac; *Tonnante*, Captain de Cornulier-Lucinière; *Lave*, Captain Dupré.

On October 17th, at 8 o'clock in the morning, the three squat vessels steamed into position opposite the Kinburn Forts and anchored at distances varying from a half to three quarters of a mile. Then they

opened a hot, regular fire, and up to the signal of "cease fire," made by Admiral Bruat, at 1.25 p.m., discharged over 3,000 projectiles and silenced the defence. The damage they received was practically nil as compared to the amount they occasioned—the *Devastation* was hit sixty-four times, and had eight men killed or wounded, and the *Tonnante* sixty-five times, with a casualty list totalling nine killed or wounded. None of the shot pierced the iron and the deepest indentations were only 3 cm. (1.1811 in.) deep; five, however, found their way in through the gun ports. It was a triumphant success for armour plate, and its adoption was from that time assured. The fear of shell quickly disappeared, and the horrors of Sinope became things of a dim past; "the ironclad was no longer an idle dream, no longer the resurrection of the fad of some long since dead and gone Dutch sailor, but the only answer to the historical cry, 'For God's sake keep out the shells.' " *

Six days after this memorable action the first two British batteries arrived at Kinburn. The type was similar to the French, but for purposes of comparison their principal characteristics are set out on the next page.

The advantage of speed possessed by the British vessels,† was wholly due to the better lines fore and

* Fred T. Jane in his "Imperial Russian Navy."

† *Thunder, Trusty, Glatton, and Meteor.*

	French Batteries	English Batteries
Length . . .	171 ft. 9 in.	175 ft. 6 in.
Beam . . .	43 ft. 1 in.	43 ft. 10 in.
Draught, maximum	8 ft. 8 in.	9 ft. 3 in.
Displacement .	1,651 tons	1,698 tons
Nominal H.P. .	225	150
Speed . . .	3·7 knots	4·5 knots
No. of Guns .	14 68-pdrs	16 large, 2 small
Armour, thickness	4·33 inches	4·5 inches

aft, and an improved and vastly more efficient form of propeller.

1855.—**M. Gervaise.**—In 1855, M. Gervaise again came forward with plans for an armoured battery, but they differed little from those he had suggested in 1847, and were not a sufficient improvement on the *Devastation* class to receive more than passing notice. Of course, no sooner had the value of armour been incontestably proved than every naval constructor at once set about designing ironclad vessels. Captain d'Harcourt, who had commanded the *Devastation* for some time, was particularly full of new ideas, having chiefly to do with the internal arrangements of armoured ships. He had the subsequent satisfaction of seeing many of his proposals carried into effect. Commander Dupré (Captain of the *Tonnante* at Kinburn) proposed the construction of two classes of armoured ships. The first was to be a mastless broadside ship; indeed, an improved *Devastation* with finer lines, more draught, greater speed and an armament of 12 rifled cannon. These

were to form a blockade battle-fleet. The second design foreshadowed the sea-going ironclad; it was to carry reduced armour, have a speed of 12 knots, and be armed with 16 shell-firing cannon of 22 cm. and two small rifled cannon in the upper works. He merely indicated his ideas as above, and these were obviously too meagre to work upon.

1856.—**Guesnet.**—On May 24th, 1856, M. Guesnet, a naval engineer, proposed the construction of a series of frigates armoured with plates of the same thickness as those applied to the batteries of Kinburn. The main difference was to be in the armament, speed and size. The first would consist of eighteen 16 c.m. rifled cannon, and eight 12 cm. shell guns on the upper deck. The engine supplied with steam by Belleville boilers would have a nominal force of 600 H.P., capable of driving his ship at 12 to 13 knots in a calm sea. A feature of this design was to be the stern, which, similar to the bow, would fine away into a point, thus avoiding complicated curves for the armour plates.

The most astounding part of the idea was, that in order not to frighten foreign Powers by the simultaneous construction of so many invincible ships, a few should be laid down at a time, and these only three-quarters completed; then, on the outbreak of war, work would be energetically resumed on the hulls, and, owing to all material being in readiness, they would be finished outright in three or four

months. It is a curious fact, in the light of their very general employment to-day, that it was the proposal to install Belleville boilers that caused the plans of M. Guesnet to be set aside as unpractical.

Marielle.—Engineer Marielle presented his project in a *Mémoire* on the use and construction of ironclad ships, published on November 14th. Though we are not told the dimensions of his proposal, a few features were made public. The armour belt was to be 1 m. 20 above the water-line, and its thickest plates were 120 cm., as against 110 cm. in the armoured batteries. The armament, carried on two decks, included ten shell-firing cannon of 22 cm., and a similar number of rifled guns of 16 cm. The speed would be 12 knots, and very little rigging was to be carried.

De Ferranty.—The last design I have to chronicle in this chapter was by M. de Ferranty, also an engineer of the French Navy. One distinguishing feature was an iron bulkhead about twenty feet from the bows, this forming a water-tight compartment and adding to the security of the vessel in the event of her ramming an opponent. The armour was, as in the former design, to be 120 cm. (4·7245 in.), in thickness at the water-line, but over the battery M. de Ferranty reduced it to 100 cm. (3·9371). The armament was very heavy, eighteen large rifled cannon and sixteen 22-cm. shell cannon, all in the battery. It will be seen from the above that the ideals of the various

designers resembled each other very closely in most particulars. The study of these designs impressed on the Ministry the necessity to do something definite in the matter and an order was given to the Minister of Marine asking him and his staff to go fully into the matter and learn as far as possible how to set about the construction of armour-defended war-vessels.

On December 23rd, 1856, the Council appointed for the above purposes presented its report. Herein it was written that from experiments made they could state definitely that in the very near future the composition of fleets of war would undergo a profound and lasting modification owing to the inevitable introduction of new types of war-vessels, capable of withstanding up to a certain point the attacks of the artillery then in use, whilst preserving the same speed and seaworthiness. In view of this assertion it behoved the Ministry to consider very carefully whether France should not be the first to make the change, and in the event of their agreeing, the naval authorities would take immediate steps to find out which design was most suitable for the experiments.

1857.—**M. Audenet.**—The Ministry did not take long to consider the report, and as a result, on June 30th, 1857, no fewer than eighteen sets of plans were placed before the Council for consideration. The majority of these were nothing more than modifications of the *Devastation* class, and these were at once cast aside as unsuitable. The two that received a

favourable decision were practically similar; the first, by M. Audenet, proposed an iron hull, the second, by Dupuy de Lôme, was to have a wooden hull. Of the two, that of M. Audenet deserves in reality the most praise, though he did not see his ideas materialised until the *Gloire* of Dupuy de Lôme was already in being. He foresaw that wooden hulls would never stand the strain of powerful engines, nor the weight of heavy iron plates. Moreover, as he argued before the Council, the iron bolts attaching the plates to the wooden hull would soon wear themselves loose, and the wood rotting between the two substances might conceivably cause very grave dangers to arise. That his contentions were right has since been proved, for whereas the hull of our first ironclad, the *Warrior*, was after forty-five years of service declared to be as sound as when launched, very few of France's wooden ironclads of the same and even later date existed, and their early disappearance has been due, either to decay or absolute unseaworthiness and not to a rigid exclusion of old vessels from the official list.

We have now arrived at the period marking the real birth of the ironclad, and its further development in the various navies must be left to other pens. Here, we had no other intention than to pass in general and short survey the pre-*Gloire* era.

CHAPTER IX

ON NAVAL LIFE AND PUBLIC KNOWLEDGE

IF ever a race were full of the sentiment of sea-power, it is surely that which flourishes under the Union Jack. At concerts, at meetings (in and out of doors) we sing, with more or less correctness, "Rule, Britannia!" and other inspiring national sea songs; all these things we do, have done in the past, and, doubtless, shall insist upon doing in the future.

Not but for a fleeting moment the writer would have it otherwise, but—those awful "buts" and "ifs"—it is a little incongruous that four-fifths of the nation which thrives so well on patriotic fervour should know so little of the force which alone lies between it and foreign dominance.

Taking the United Kingdom alone, ignoring the teeming myriads of his Majesty's subjects over-sea, I wonder if a single million of the 45,000,000 odd in the population could distinguish between a destroyer and a protected cruiser? And, by the same token, I am insulting enough to assert that barely a quarter

of that total could tell a battleship from a banana without a helping hint!

Why is all this? If it is denied—well, I shall refuse to credit the denial. Is it ignorance? Does the Press or do writers ignore naval subjects? No, neither of these things; it is just stubborn lack of interest accentuated by the growing and dangerous anti-British, anti-militarist, spirit of the age.

Thus, the German Navy League has over a million members, bonded to support a *luxury*—for so Mr. Winston Churchill rightly describes the Teuton Fleet. Our whole Empire can find no more than 100,000 members out of some 450,000,000 people sufficiently enthusiastic to join a similar organisation for the development of a national *necessity*—again Mr. Churchill's word.

Little wonder, then, that the Navy being so little known in its broad outlines, the mass of the people should possess still less knowledge of its details, history, and working. It is not my intention to touch here upon matters outlined above; opportunity for so doing, both in speech and on paper, is often enough presented on other occasions. But there are features, almost amounting to curiosities, that deserve passing notice, and the remembrance of which by those reading them will not come amiss to any naval discussion.

At the close of the South African War, the home-coming of a huge protected cruiser of 14,100 tons was

made a great heyday and holiday ; her Naval Brigade had (as always where our sailor-folk are called upon to lend a hand) added further lustre to British naval history at Ladysmith and other tough localities. I walked amidst the crowd from the Hard at Portsmouth to the pontoon where my launch awaited me. Coming out of the Harbour Station as I passed, two well-dressed women sighted the old *Victory* at anchor, and one said to the other in a loud voice of startled disappointment :

“ Oh, my dear, how aggravating ! There she is, already at anchor ! ”

I hope I shall never meet those two women ; I shall break a family tradition and be rude to them.

One of the first duties of a lad, when he joins the Fleet of England, is to teach his relations how to talk of his floating home. It paralyses him to hear a doting mother say to an admiring aunt, “ I see so little of him ; he’s always *on* his ship.” When will those parents learn to say “ *in* ” ? After all, you don’t live “ *on* ” a house ; you live “ *in* ” a house, don’t you ?

It takes some time, too, for us poor landfolk to get accustomed to the nomenclature, not only of ships, but of officers. Gay and irresponsible talk in which “ The Owner,” “ Number One,” and “ Snotties ” occur is apt to put the ordinary mortal off his balance. The words are quite simple of explanation, though their derivation is painfully obscure. It is one of

the tenets of the Service that nothing should be called by its proper name, so nicknames rule the roost.

How little this is understood by us inferior toilers on solid ground is instanced by the fact that the term "Jack Tar" is unknown in the Fleet; the sailor-man is a "Matloe" or "Flatfoot" as to general classification, with yet another term for each separate rating.

To start with the top, however, the admiral is exempt from drollery except in secret whispers; he is usually "Old" somebody or other, according to his name. The captain is the "skipper" or "owner," and the commander (the official maid-of-all-work) is called everything under the sun, both by superiors and inferiors; most times it's something nasty, and frequently quite rude. He is also termed "the bloke," which is crisp and expressive. The First Lieutenant is "No. 1" on the quarter-deck and "Jemmy-the-One" amongst the men.

Next comes a bunch of lieutenants—the Navigators, Torpedo-men, Gunnery, also the junior ones, who are the watch-keepers. Of course, the first named is called "Pilot," also "Tankey"; but why, Heaven only knows! Looking up a glossary of naval terms, I find the following: "The Gunnery-Lieutenant is a harassed individual, intoxicated with schemes and views bounded by the scope of the Gunnery Manual, with an irresistible penchant for talking shop." This is a gross libel.

One of these is given charge of the midshipmen in such ships as carry these things; he is called the "Sea-Dad," though recently I heard a new insult—to wit, "Snotty-Boss"! And then the midshipman (pray don't call them "Middies"; really, it's not done): he has been described as a biped of extraordinary stupidity, used as a medium for personal abuse between two people of unequal seniority.

Probably my house will be wrecked for writing this, so I hasten to add that, whilst a deuce of a potholer taken in the aggregate, he is individually the finest material of his age and size in the world. After all, the midshipman of to-day is the admiral of to-morrow. I am making a hobby of this epigram.

Six-score years ago the midshipmen of the day wore uniforms not permitting of pockets, so handkerchiefs were, alas! lacking. Keeping watch on board a wind-jammer doubtless brought moisture to the nose as it does tears to the eyes; deprived of that medium for obtaining relief to hide which the sleeve of the military uniform is admirably suited, these juvenile officers of the last century, and a bit before, wiped their nasal organs with the butt of their sleeves.

I have tried to word a touching story as delicately as may be, and hope to have met with success, for the amazing sequel is upon us. No less a man than Lord Nelson took notice of this unbecoming habit, irritating to the nose as it was soiling to the uniform,

and he is reported to have addressed his little batch as follows: "We cannot have this conduct in my ship; I'll soon cure you little snotters of it! Mr. Mate, kindly have three buttons sewn on each sleeve of these gentlemen's tunics!"

To this day the buttons may be found there; to this day are the midshipmen of His Most Gracious Majesty called "Snotties."

By the by, how many folk know that the three white lines around the collar of the sailor's uniform are (said to be) in memory of the Battles of the Nile, Copenhagen, and Trafalgar, and that the black scarf is worn in perpetual mourning for the victor of all three engagements? As a matter of fact, these are pure yarns, and the three white lines were not introduced until the middle of the last century.

To return to names for a minute or so. The doctor has a variety of appellations, "Sawbones," "Pills," and others; whilst the "Sky-Pilot" and "Devil-Dodger" require no explanation.

We have all heard of the boatswain's pipe, and naturally imagine that every time a whistle shrills through the decks the bo'sun is at work. Not at all; the boatswain (who rejoices in the euphonious name of "Tommy Pipes") "Pipes the Side" when the admiral pays a call, but never otherwise; the rest of the business is done by his mates. "Piping the Side" is purely a daylight operation.

This important question naturally arises: How do those on board know of the unexpected coming of an admiral? Not being a thought-reader, the petty officer hailing an approaching boat after dark is told whom to expect by a variation in the answers. He calls out (as all boys' books tell us) "Boat ahoy!" If it be an admiral coming off, the return hail is "Flag"; if the captain, the name of his ship; "Aye, aye!" for officers of ward-room rank, and "No, no," for gun-room, warrant officers, and men. If a boat is hailed on approaching, but is not going alongside, the reply is "Passing." If a monarch or Royalty be coming alongside, the cry is "Standard."

The discipline of the Service is its greatest charm, and, of course, its main strength; the slightest departure from rules and regulations is met with condign punishment, and to keep a watch on the ship's company we find the "jaunty" (or jonty) and his "crushers"—i.e. the master-at-arms and such petty officers as have been rated "ship's corporals."

The word "jaunty" is a debased rendering of the French "gendarme"; this is not generally known. If a kit-bag be found wrongly made up, or a watch relieved late, the delinquent is hauled up before the commander and punished. Until a few months ago this punishment would take the form of a "dose of 10A." If it is spread over a week the culprit, on

returning to his mess, will tell his mates he's "got seven pennorth!"

10A was the naval equivalent for "standing in the corner." The recipient had, for his sins, to face the paint on the upper deck in all his stand-easy time, to take his meals under supervision, to forgo his 'baccy, and do any dirty job that was going beneath the eagle-eye of a "crusher."

How silly for grown-up men! It was a survival of the days when our Service drew much of its personnel from the scum of the seaports through the medium of the Press Gang. That sort of man is not found in the Fleet to-day—the "Matloe" is highly educated, intelligent, and full of initiative, and, being so, should not be treated like a naughty child. Discipline must and always will be maintained, but I am glad to say that 10A has now been abolished.

Just a brief list of other common verbal currency, and we will pass to other things:

Bunting-Tosser = Signalman.

Jarbee = Able-Bodied Seaman.

Poultice-Mixer = Sickbay Steward.

Putty = Painter.

Tankekey = Captain of the Hold.

Jimmy Bungs = Cooper.

Chippies = Carpenter.

Lampie = Lamp-Trimmer.

Sparker = Wireless Telegraphist.

Stripey = Senior Sergeant of Marines.

Flunkey = Ward-room Servant.

Sticks = Bugler (formerly Drummer).

Gobbies = Coastguards.

Joey = Marine, a term fast dying out ; also known as

“Leather Neck” or “Ocean Lancers.”

There are many others that do not come to mind. But the food is also strangely called—who has not heard of Fanny Adams ? This is a certain preserved meat in tins which was introduced into the Navy at the time of a revolting murder. A notorious woman, by name Fanny Adams, was cut to pieces at a naval port, and the rumour got about that her nails, hair, and teeth had been found in a tin of this meat not long afterwards. The inference is horrible, but the story is true, and the name has stuck ever since.

Ships, too, get their names changed by their crews—in many cases their common title is in sea-lingo which does not permit of publication. The “Onion” is obviously the *Orion*, and it is not difficult to find the *Amphitrite* in the “’Am and Tripe” ; the *Royal Sovereign* has always been the “Quid,” the *Agincourt* the “Gin-Court” or “Gin-Palace,” the *Barham*, the “Baalamb,” the *Bellerophon* the “Billy-Ruffian,” and the *Pomone* the “Pom I.” “Sampan” was the title of the *Sans Pareil*.

There are hundreds of similar word-mutilations.

There are not many sails in the Service to-day, but every man, officer and crew alike, must have some knowledge of boat-sailing. The sails each

have their respective designations, but the term "sheet" so frequently heard applies to none of them. A "sheet" is the rope holding a sail, but why do they call the spare anchor a "sheet anchor"? It may be because the fore-sheet was in the old days made fast close to where this anchor was stowed. The anchors usually "let-go" in pulling up a ship are the two bower anchors; should this be insufficient, the sheet anchor follows them into the depths.

The two sides of a ship are known as "starboard," the right-hand side as you face the front, and "port," the left-hand side. It used to be "starboard" and "larboard"—from "steerboard" and "lee-board"—until the similarity of the words caused a number of accidents. In the British Navy the man at the wheel always imagines he is holding a tiller, and therefore if he "ports his helm," the ship turns to the right, if he "starboards his helm" she turns to the left. In most other countries the opposite obtains, the ship following your wheel.

When a man is at the wheel he is said to be "doing a trick." There are three chief naval "tricks"—i.e. at the "helm," with the "lead," and the "look-out," and many minor ones. On leaving a harbour the men told off for these "tricks" are mustered about a quarter of an hour before weighing the anchor and piped off to their stations. On their reports and actions the safety of the vessel absolutely depends. The following are also known as "tricks": masthead-

look-out, flag and cone, messengers, speed-lights, etc.

A striking feature of the latest modern British capital ship (a portmanteau term including battle-ships, battle-cruisers, and armoured cruisers capable of lying in line) is the tripod-mast. This is not a popular invention.

In the first place, according to the captain, it was designed to give the vessel an ugly appearance; the commander holds it to be useful for getting rid of importunate lieutenants, Number-One complains that it takes up all the room 'tween decks, the lieutenant (G) protests it was invented to provoke sea-sickness, snotties recognise it as a destroyer of clothes, the chief petty officers swear it is an instrument of torture (as they count the bruises on their ships!) whilst the lower ratings merely swear!

It serves two useful purposes, however; it supports the "wireless" and it forms a platform for the fire control, of which something later. The idea is that any two legs may be shot away, and the structure will still stand on the third. But the design is not novel. When Captain Cowper Coles designed the ill-fated *Captain* in the late 'sixties of the last century he gave her tripod masts, whilst the two remaining Japanese protected cruisers of the *Hashidate* type, built twenty years ago, each mount one to this day.

The fire-control platform, referred to above, is the place whence the range is sent down to the gun-

layers. It is the successor to the fighting-top, which has long been discarded in all navies ; no guns are now mounted in these structures for obvious technical reasons that require no explanation.

Lately, owing to the proximity of the forward funnel to the bridge in many new ships, the space about the charthouse, known as "Monkey Island," has been christened the "fire-control platform," because you are so close to the heat surging over the funnel-top, you can almost control the fires in the stokehold by merely looking down the smokestack !

Indeed, the fumes and emanations blacken the fair visage of the officer of the watch to such an extent that he is frequently asked on his return to the wardroom whether he has been on duty above or in the engine-room ! The officer of the watch, if a navigator, is the essentially useful individual who spends his life avoiding the collision, which, if it comes off, will wreck his career.

At sea he works twenty-five hours a day and sleeps the rest ; in harbour he dons his best uniform to attract lady visitors whilst telling taradiddles to their male escorts. He also keeps in friendly touch with the commander ; he will be a commander himself one day, and the duty has been brought to a high and honourable art which takes some learning.

A close look at the nose of any Dreadnought will disclose the fact that it is ram-shaped. Yet it is

not designed to ram, and has no strengthening for that purpose; the shape is said to give evolutive powers, and is, therefore, retained.

Coming to ship types, it is interesting to note that the *échelon* method of mounting guns found in the battle-cruisers of the *Invincible* class was quite popular in Italy and this country over thirty years ago. By this method, two turrets or barbettes are so placed in the centre of the ship—diagonally-athwartship is the technical term—that the guns in them can fire not only ahead or astern, but, over a considerable bearing, on both broadsides.

Just as we are discarding this principle for the "keel-line" ideal wherein all the guns are mounted on a line parallel with the keel, the Germans are taking it up; this is, therefore, the opportune place for setting out that, despite the plaintive bleats of the national scaremongers, our designers still manage, at any given moment, to be some years ahead of probable or possible opponents in ship construction and gun disposition.

On the commissioning of the *Orion*, the Press greeted the fact with the statement that she was the first ship to be completed mounting the 13.5-in. gun. But the early Rodneys, launched in 1885-86, each carried four of them, though vastly inferior as fighting weapons from all points of view. Our next gun will be the 15-in., and then, doubtless, the 16.25-in.—this is the calibre of the gun mounted first in the *Benbow*,

laid down in 1882! But her guns were as notoriously inefficient as the new ones will be efficient.

Naval guns of to-day carry with ease beyond the horizon of human sight—that is to say, greater range is no longer sought in perfecting guns. The energies of gunnery experts are devoted to obtaining a speedier flight, giving a flatter trajectory (therefore, an increased “danger zone”) and a heavier projectile, which latter means more “smashing” power on striking.

The old 13·5-inch weighed 67 tons; those in the *Orion* are 20 tons heavier, though the shell weighs the same. But the *King George V.* class, following the *Orion*, mount 13·5-in. guns firing a 1,400 lb. shell. It is in their successors that a still more powerful gun will be mounted.

The modern gun, if the sea be mirror-like and the object stationary, cannot miss. At a certain recent bombardment in South Africa, an officer said to a gunner: “Hey! you—that fellow on the kopje over there is too bally clever with his gun. Put his eye out for me!”

“Aye! Aye! sir—which eye, sir?” came the unexpected reply.

With the old muzzle-loaders the ball could be seen bouncing over the waves towards its mark—even the modern shell can be photographed in flight from behind the gun. A 12-in. projectile laid to 10,000 yards, and weighing 850 lb., will, on striking the

sea, ricochet from the water before it has penetrated three feet! It is for this reason, amongst others, that warships are not armoured below the water line for protection against gun-fire.

The engines in all warships, being the most vital part of the vessel, are particularly immune from attack. Apart from any side armour there may be, they are always placed beneath a curved armour deck, or steel carapace. A projectile striking this does so at a very acute angle, and bounds off upwards or sideways.

The edges of this carapace join the bottom of the main belt, and below this space is a self-contained, unsinkable ship, on which are built up the top-works and gun-mountings. The great towers carrying the guns of the main armament descend to the bottom of the ship, and in each case open out into an ammunition room. Each of these gun-positions is entirely independent of the other, so much so that if one broke down the others would not know of it.

For the purposes of convenience (and discipline), and evenly to distribute the duties of the starboard and port watches, the crew is mustered by divisions, a similar thing to a company in the army. The day commences for the work of these divisions at noon, and is thus divided, each half hour being notified by "Bells":

1. Afternoon Watch, noon to 4 p.m., Eight Bells.
2. First Dog Watch, 4 p.m. to 6 p.m., Four Bells.
3. Last Dog Watch, 6 p.m. to 8 p.m., Four Bells.

But here the Bells do not run in two series from 1 to 4—they “go” as follows :

First Dog, 4.30 = 1 bell ; 5.0 = 2 bells ; 5.30 = 3 bells ; 6.0 = 4 bells.

Last Dog, 6.30 = 1 bell ; 7.0 = 2 bells ; 7.30 = 3 bells ; 8.0 = 8 bells.

4. First Watch, 8 p.m. to midnight, Eight Bells.

5. Middle Watch, 12 a.m. to 4 a.m., Eight Bells.

6. Morning Watch, 4 a.m. to 8 a.m., Eight Bells.

7. Forenoon Watch, 8 a.m. to noon, Eight Bells.

At midnight on December 31st, sixteen bells is struck to bring in the New Year. The youngest midshipman in the ship used to do this.

There is still another “Bell” in the service ; at night time at sea, five minutes after the new watch has taken over its duties they are mustered by their names being called out of the “watch-bill,” and one bell is struck to call them on deck. This is called “Little-One-Bell.”

How long is a fathom, and what is a knot ? These questions are often put to me, and they may usefully be answered here. A fathom is 6 ft. and a knot is 6,080 ft. A knot is a sea-mile for speed trials and distance expression ; it is the conventional, though erroneous, term for that mathematical factor known as the Nautical Mile—but the Nautical Mile proper is one-sixtieth of a degree (or the length of a minute of the meridian), and differs according to the latitude. Thus it varies from 6,046 ft. on the

Equator to 6,092 ft. in latitude 60 deg. You can describe a ship as steaming at 20 knots, but a ship cannot be said to have steamed 20 knots in an hour. The difference is fugitive, but vastly important.

A cable's length is the tenth of a Nautical Mile, taken for convenience, and to avoid fractions, at 600 ft.

By the by, cables differ according to the country ; thus the Austrian "Seetaktik" is 656·18 ft., or 200 metres ; and this is also the length of the new French official measurement and of the Spanish " Medida o cable." The longest cable is the Portuguese " Estadio " of 846·47 ft. ; the shortest is the German of 590·56 ft. All nations, including ourselves, recognise, in addition to their naval measurement, the Hydrographic Cable of $\cdot 1$ of a mile, or 606·97 ft.

From measurements let us proceed to pay. The highest active pay in the Navy is that drawn by an Admiral of the Fleet, £2,190. This is frequently supplemented by an Order in Council should the officer be engaged in specially onerous duties. The lowest paid units are Boys, 2nd Class, and Boy-Artificers, who draw only £9 2s. 6d. a year. In the first case, the sum is net, and cannot be increased until advancement to 1st Class Boy, this bringing the total to £10 12s. 11d. In the second case, the pay of the Boy Artificer is on a sliding scale up to £13 13s. 9d.

No lad of intelligence and application remains

long in these lower grades, and the pay of a clever warrant officer as he reaches the rank of Com. War. Officer attains £219, with, if he be promoted from Warrant Rank, a maximum of £273 15s. It cannot be contended that the pay of all ratings is satisfactory, and the officers in the lower ranks, especially the senior Lieutenants and Commanders, have, in view of the onerous duties they are called upon to undertake, some right to a little more generosity from the country they serve.

A Commander draws £401 10s.—no vast fortune for a man of thirty-three to forty years of age, with a definite position to keep up, and possibly (and small blame to him) a wife and family to support on shore.

The Rule of the Road is of necessity, in these days of motors, common property on shore; at sea, it is as breathing to those that spend their lives on the ocean; this cannot be said to be the case with all of us land-lubbers. In the daytime the trouble is not vast—follow your instinct, “port” your helm, and pass one another on the left. At night, the lights are the guide.

A RED light is placed, free from all obstructions, on the port or left-hand side of the ship; a GREEN light is placed on the starboard or right-hand side. Some years ago a clever series of lines was written, giving the Rule of the Road in concise form:

WHAT OF THE NAVY?

1. *Two Steam Ships Meeting :*

When both side-lights you see ahead
Port your helm, and show your RED.

2. *Two Ships Passing :*

GREEN to GREEN—or RED to RED—
Perfect Safety—go ahead !

3. *Two Ships Crossing :*

If to your Starboard RED appear,
It is your duty to keep clear ;
To act as judgment says is proper,
To Port—or Starboard—Back or Stop her !
But when upon your Port is seen,
A Steamer's starboard light of GREEN,
There's not so much for you to do,
For GREEN to port keeps clear of you.

4. *Finally :*

Both in safety and in doubt,
Always keep a good look-out ;
In danger with no room to turn,
Ease her, stop her, Go astern.

It may be added that a steamer always gives way to a sailing ship, except when the sailing ship is the overtaking ship.

I have often been asked why the ships of our fleet have coloured bands round their funnels. The reason is simply this—that units of the same class may be distinguished the one from the other. What is not generally known is that these daylight signs follow in each case a definite sequence in the alphabetical orders of the ship's names.

Take the King Edward VII. class as an example. Here are eight huge battleships of 16,350 tons, as alike as peas in a pod—yet if the admiral of a combined fleet chances to have them manœuvring under his orders, and desires to compliment or blame one of the eight, he can do so at a moment's notice without asking the vessel in question to “make her number.” He picks out the fortunate ship and sees she has a white band round each funnel, and signals his congratulations at once to the *Dominion*! For in this way are they marked:

<i>Africa</i> . . .	No bands.
<i>Britannia</i> . . .	One White band on <i>After</i> Funnel.
<i>Commonwealth</i> . . .	One White band on <i>Forward</i> Funnel.
<i>Dominion</i> . . .	One White band on <i>each</i> Funnel.
<i>Hibernia</i> . . .	Two White bands on <i>After</i> Funnel.
<i>Hindustan</i> . . .	Two White bands on <i>Forward</i> Funnel.
<i>King Edward VII.</i>	Two White bands on <i>each</i> Funnel.
<i>Zealandia</i> . . .	One Red band on <i>each</i> Funnel.

Substitute for the eight ships above the eight vessels of the *Formidable* class (of course in alphabetical order) and they will be found to have the same funnel-markings. It is easy enough for the trained eye to distinguish *class* from *class*, and a few elementary rules will enable even the tyro to distinguish one type of ship from another.

Though possessed of varying battle-values, the British Navy may be divided into rough-and-ready sections:

WHAT OF THE NAVY?

1. Battle-Ships : The " heavy-weights " of a fleet, destined to give and take hard knocks.
2. Battle-Cruisers : Modern developments of Armoured-Cruiser and Battle-ship in combination ; they possess the speed of the former and the fighting power of the latter.
3. Armoured-Cruisers " Eyes of the Fleet " with vertical side protection.
4. Protected Cruisers : " Eyes of the Fleet " without vertical protection, but with a curved deck covering their vitals from bow to stern.
5. Unprotected Cruisers : As above, but minus the curved deck.
6. Torpedo-Gunboats, Destroyers, Torpedo-Boats : Comparatively small craft evoked by the invention of the torpedo, the use of which they are designed to promote or prevent.
7. Submarines : Torpedo-using war-vessels possessed of the power of acting below the surface of the sea.
8. Naval Auxiliaries : Torpedo-Depot-Ships, Submarine-Mother-Ships, Hospital-Ships, Repair-Ships, Distilling-Ships, etc. Classes of ships may next be distinguished by the following features :
 - (a) Disposition and method of mounting the guns.
 - (b) Number and disposition of the funnels.
 - (c) Details of general appearance.

Ships are painted light grey except destroyers and torpedo boats, which are black all over.

Big guns, forming what is called the main armament of battleships, battle and armoured-cruisers, are mounted in gun-houses, turrets, or barbettes. The secondary armament (of quick-firing guns) is

mounted in casemates, i.e. gun-houses built into the side of the ships, or else behind shields on the upper or boat decks.

Here then are some things of interest to the Briton. No pretence is made at comprehensive reference; such could not be in the space at my disposal, but the above are a few of the "little known" features of naval life.

May I be permitted to proffer a word of advice, and it is this: Study the Navy, first hand or second hand, I care not which, but study it; and well will the trouble be repaid. It is based in all its strength to-day upon the sentiment of its glorious history.

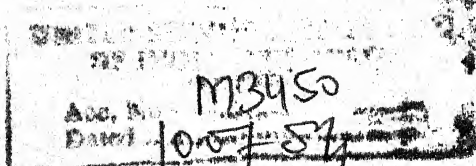
As to its ships, we have even yet (*pace* those who never cease to croak) the mightiest battle ship, the hugest and fastest battle-cruiser, the finest protected craft, the swiftest destroyers, the most terrible submarines in the world. Some god of Chance—or is it still the Fairy Foresight that guides our Path?—has left us, despite European vapourings, Mistress of the Seas.

So I would urge again, study that force that gives us our national life, so that in his or her knowledge, each unit of our race may feel justified in pressing Those that Rule ever to maintain a ready vigilance and a clear eye to the clouded future.

It is not by ships alone that Sea-Power is maintained. The men are the backbone of naval power, and, please God, they will never fail their country's

call. It is but a poor compliment to them, yet the barest truth, to say that they are to-day as capable of maintaining our ancient and honourable traditions should necessity arise as ever in the history of our Realm.

Nor is the statement losing in significance when we realise that over all there reigns a man versed from boyhood in everything that pertains to the sea, our Sailor King, his Gracious Majesty George V.





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